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ABSTRACT

A survey is presented of the types of problems which correspondence educators have to consider today. After discussion of the general characteristics and definitions of correspondence study, varying traditions in different parts of the world as to subject matter and student body are covered. A large, detailed section is given to the construction of a correspondence lesson and a correspondence course; it includes the planning and arrangement of material, new approaches, independent courses and courses based on textbooks, the use of subsidiary material, style and langauge, illustrations, typography, summing-ups and study helps, students' technique of study, and means to help students secure knowledge acquired (repetitions and introductory surveys, questions, exercises, diagnostic and prognostic tests). A concluding section covers the teacher at work, advising students and supervising study, the impetus to apply supervised correspondence study in schools, the correspondence school and its administrative problems, and supplementary oral instruction. A bibliography and a list of correspondence institutions whose correspondence courses were studied are added. (EB)

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BÖRJE HOLMBERG

CORRESPONDENCE EDUCATION

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EDUCATION

A Survey of Applications,
Methods and Problems

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Correspondence Education in the 1960's

Interest in correspondence education has increased considerably during the last decade and much has happened since I published my first survey of its methods in 1960[1]. Governments and educational bodies have become increasingly aware of the possibilities offered by correspondence education,[2] convincing documentation of its achievements has been produced[3] and a fairly universal need for unconventional approaches to methods of enlarging educational facilities has made itself felt following the demand for increased and more rapid training, the result of a series of new developments in modern society.

In Europe favourable experiences reported from, above all, Scandinavia have caused considerable attention, and so have interesting developments in Germany and the Soviet Union. The European Council for Education by Correspondence (CEC), founded as late as 1962, has stimulated this interest, not least by its Yearbook for 1965 reporting on

In the footnotes normally only the names of authors or other headwords are mentioned. For further information readers are referred to the bibliography at the end of this book.

1 *On the Methods of Teaching by Correspondence* (Lunds Universitets Årsskrift N. F. Avd. 1 Bd 54 Nr 2 1960); reprinted with small additions as a special number of the Home Study Review (1961 No. 2; Washington D. C.) and in a (slightly revised) German translation (*Über die Lehrmethoden im Fernunterricht*, Verlag Walter Schultz Kg, Hamburg-Rahlstedt, 1962).

2 As illustrations may be mentioned a UNESCO plan for a how-to-do-it book intended for the developing countries by Miss Renée Erdos of Sydney, Australia, several governmental reports in Scandinavia (e. g. *Vuxenutbildning* 1965 — an official report of the Swedish Ministry of Education), the negotiations between the West German Kultusministerkonferenz, other authorities and the Stiftung Volkswagenwerk resulting in the Institut für Fernstudien organized at the University of Tübingen, the accreditation schemes of the Association of British Correspondence Colleges, the Cleaver-Hume Group of Colleges, the National Extension College and others in England, new legislation in Belgium, Denmark and other countries, agreements between the National Home Study Council, Washington D. C., and State and Federal authorities in the USA.

3 See the East German *Bibliographie Fernstudium*, the reference to official reports in note 2 and Otto Peters, *Der Fernunterricht*.

a European conference held in Malmö, Sweden, in 1964 and its descriptive study of European correspondence education in the CEC Yearbook for 1966 (pp. 42—77). In Western Germany, where the part played by correspondence education has developed in a striking way, a scholarly periodical devoted to this kind of study has been regularly issued since 1963, so far the only one to appear in Europe.[1] A most valuable contribution to the study of correspondence education was made in 1966 by the Institut für Fachschulwesen der deutschen demokratischen Republik (Eastern Germany), publishing a very full bibliography (*Bibliographie Fernstudium*). The press, even in countries where correspondence education until very recently used to be regarded as either a pathetic or a negligible teaching method, has paid considerably more attention to it than ever before[2]. Above all it should be stressed that correspondence education has not only gained wider recognition during the last decade but has in actual fact contributed more to European educational endeavours than ever before.

In the United States the responsible institutions providing correspondence instruction have — through their actual work and through their organizations, the National Home Study Council and the National University Extension Association — improved the position of American correspondence education. The state-controlled correspondence instruction in Canada, Australia, New Zealand and elsewhere has developed further, and the same may be said about the applications of the method in various parts of Africa and Asia, not least in Japan, where cooperation with radio networks has been established on a firmer basis than in most other countries.

A greater number of scholarly studies on problems connected with correspondence education has appeared in the 1960's than during any other period and interesting experiments have been made with new methods[3]. The International Council on Correspondence Education

1 *Epistolodidaktika* (Walter Schultz Verlag), edited by K. Graff and R. M. Delling.

2 In the 1960's *The Times Educational Supplement*, *The Observer* and *Where?* in England can be referred to as notable examples. On German examples see the bibliography successively provided by *Epistolodidaktika*.

3 The papers by Childs and Graff in the Proceedings of the Seventh International Conference arranged by ICCE (Stockholm 1965) bear eloquent witness to this, and so does Peters' comprehensive study Der Fernunterricht. A new series of such studies was started in 1965 by Charles Wedemeyer under the

arranged a very successful conference in Stockholm in 1965 with more than 200 participants representing 31 different countries. There can be no doubt that that conference, in the course of which reports on new activities in various parts of the world were given, inspired much new work and acted as an important exchange of ideas and experiences.

The background of this booklet is thus rather different from that of my presentation of the subject in 1960. Like that earlier paper, this intends to offer a study of some important aspects of correspondence education and a short discussion of some methodological questions. I am anxious to stress that it is not meant to be an exhaustive description either of applications or of methods but only a modest survey of the type of problems which correspondence educators today have to consider.

General Characteristics and Definitions

Correspondence implies that two or more parties are in contact with one another in writing. Consequently correspondence teaching is taken to mean teaching in writing, in the course of which the student and the teacher are in regular contact with each other, normally by writing to each other. Teaching by correspondence is a natural means of instruction if the instructor and the student are at a distance from each other. What is above all characteristic of correspondence teaching is that there is two-way communication between teacher and student. This two-way communication need not necessarily be practised in writing but can be achieved by tape recordings or telephone contact.[1] However,

title *"The Brandenburg Memorial Essays on Correspondence Instruction"*. Further, Dr. Ossian Mackenzie of Pennsylvania State University is now conducting an extensive study of correspondence instruction for the American Council on Education.

1 This is what happens in the multi-media project of the University of Wisconsin at Madison and in the HERMODS-NKI teaching of English pronunciation through the course *How to Pronounce*. Computer-assisted instruction, although it includes a kind of two-way communication by means of electronic equipment, is not correspondence education according to my definition above as the communication is automatic and does not allow spontaneous questions and answers (outside the programme), but it can easily be included as a valuable auxiliary. See further pp. 66—67.

so far the completely dominating means of contact is the written word, i. e. normal correspondence.[1]

Many terms are in use for correspondence teaching, e. g. *postal tuition*, *tuition by mail* and *home study*, the last-mentioned term predominating in the US (where, however, the word *tuition* in this context is seldom understood, tuition in American usage normally denoting not the teaching but the fee paid for teaching). Sometimes there are slight shades of meaning in which apparently synonymous terms differ. This seems to be the case in German, where — among others — the following words are used, sometimes but not always indiscriminately: *Fernunterricht*, *Fernstudium*, *Heimstudium*, *Briefunterricht*[2]. The French seem to be fairly consistent in using the term *enseignement par correspondance*. For terms in other languages see Delling.[2] In the interest of lucidity I wish to stress two-way communication as the essential characteristic of correspondence teaching.

The correspondence is normally based on a specially prepared course, which is a necessary means for making it possible for one instructor to teach a number of students. Of course there is nothing to prevent correspondence instruction from taking place without a pre-written course being used. H. S. Hermod is said to have started his activity as a correspondence educator by writing personal letters to a student who had to move from the town in which his school was situated, and similar work is done even today. For evident reasons this must be an exceptional form only. The correspondence course, prepared in advance, is the necessary basis of normal correspondence teaching. Sometimes distinctions are made between correspondence courses and self-

1 The most exact definition I know has been formulated by Sommer: "Der Fernunterricht ist eine planmässige und systematische die Auswahl, Aufbereitung und Darbietung der Lehrstoffe sowie die Sicherung und Überwachung des Gelernten umschliessende Tätigkeit, bei der Lehrender und Lernender in der Regel ständig räumlich voneinander getrennt sind und mit Hilfe relativ selbständiger Medien in Verbindung stehen" (*Epistolodidaktika* June 1966), which I translate as follows, "Correspondence instruction is a planned and systematic activity, which includes the selection, preparation and presentation of the teaching material as well as the securing and supervision of what students have learnt and in the course of which teacher and student are normally geographically separated from each other the whole time and keep in contact by means of fairly independent media."

2 Cf. Delling, Versuch der Grundlegung zu einer allgemeinen Fernunterrichtstheorie.

teaching courses, the latter not requiring the submission of lessons but possibly including an end-of-course test.[1] The use of correspondence course material as such self-teaching courses has increased remarkably in Sweden in the 1960's as a consequence of a growing need of self-instructional media in schools.[2]

A correspondence course must by definition be something different from a textbook with questions. A textbook gives all relevant facts and — if it is a good textbook — it does so in a clear and logical way, but it does not teach, which we must expect a correspondence course to do. The representation of facts in a textbook has normally to be supplemented by the exposition of a teacher, who tells his students what to pay most attention to, what comparisons to make etc. A correspondence course provides actual teaching by giving complete explanations with elucidating examples and by constantly referring to what the student has already learnt to master.

It is thus a substitute for both a textbook and the exposition of a teacher (unless the course is attached to one or more textbooks, in which case it replaces the teacher's comments only). Naturally this does not mean that it is a complete substitute for the teacher in class (who does not only lecture but also listens, argues, illustrates by means of experiments etc.). Further, it must be borne in mind that the correspondence instructor has essential tasks, however good the course is. The correspondence course is meant to compensate for that part of a good teacher's activity that consists of motivating students, presenting the subject, providing exercises and tests (see below).

The material to be taught is divided by the author of the course into parts, suitable as study units, which are often sent to the student as his work progresses.[3] After a student has completed his study of one part, he has to answer certain questions, solve set problems, report on experiments made according to instructions, or do some other written (or, in exceptional cases, orally recorded) work that is to be sent to the school, from which it is returned with the instructor's corrections, comments and suggestions.

1 See Bradth on the activities of The United States Armed Forces Institute (USAFI).

2 See my paper in The Brandenburg Memorial Essays on Correspondence Instruction — II (1966).

3 Cf. below, however.

The idea behind the division of the material into study units is that the student should be offered a suitable quantity of learning matter at a time so that he can regard the study of each unit as a separate task and can always survey the material to be learnt. The theory is that in this way it is possible to prevent the bulk of possibly difficult study material from intimidating him. He is encouraged to learn one unit at a time and to see how the units he has completed link together. Without being repelled by the sight of material which is as yet too complicated for him, he can judge from the number of lessons in his course when it will be possible for him to have completed it. With each finished unit and with the test tasks in it completed he sees the result of his work.

The length of study units varies from school to school. I have for many years considered it ideal to keep them fairly short, that is not more than 16—24 pages in length. The study units of some most reputable schools are considerably longer and there is nothing to indicate that this has had a negative effect. It even occurs that the entire course in a subject is bound in a single volume which is sent to the student at the time of enrolment[1], whereas other schools, after a student has completed his course, provide another set of study units, this time bound in a volume to be easily available as a work of reference.[2]

The question of the ideal size of study units and of the form of presentation is at present being scholarly examined by at least one school. This problem should be coupled with the desired frequency of the submitting of solutions for correction and comment. The relevant questions are if, or to what extent, students' motivation and perseverance are influenced by

a the presentation of the material in small units as opposed to booklets of 50—100 pages or normal books

b the distribution of the material in small units following the speed of the individual student's submitting of written work as opposed to the dispatch of the whole bulk of the material in one consignment

c the frequent submitting of work for correction and comment as opposed to fewer tests.

1 This is the procedure, normally practised by the Metropolitan College, St. Albans, and others.

2 This is the traditional procedure of HERMODS-NKI, Norsk Korrespondanseskole and Danmarks Brevskole.

Question c is to be dealt with in this context as it is the normal practice to finish each unit with a test-paper to be solved and submitted for comment. If under such circumstances the presentation of material in bigger units yields as good results and is felt to have the same motivating force as that of the small-unit system, then it has been proved that the former way of presentation of the material under investigation *including fewer lessons to be submitted* is superior to the latter. This is a problem with both educational and financial aspects. In some countries where correspondence education is by no means a learning device practised either exclusively or mainly by well-motivated and intellectually eager students but by the average men and women who have to improve their knowledge to be able to manage a job or get through school, it is as important to reduce the amount of time-consuming written work as far as possible as it is to keep interest alive by a sufficient number of test papers. The problems as to what the ideal size of study units is and how often lessons should be submitted to produce the best results possible are well worth looking into. It is to be hoped that the research project referred to is followed by a series of similar investigations as it is very difficult to draw general conclusions from the results of one or two individual investigations. However, each such investigation contributes considerably to our actual knowledge as opposed to our assumptions and pedagogical intuition.[1]

Childs reports from one investigation that "a series of frequent tests does serve as a strong motivating force and an effective method of sustaining student interest. The prospect of a test which the student knows will not consume a great deal of his time and energy appears to assist his concentration upon the subject matter; the challenge of the test seems invigorating."[2]

The units of study (=parts of courses) mentioned above are sometimes called "letters", which seems to be an adequate term if the units are sent to the student as letters and are not parts of books. In the early days of Hermod's school, the founder went so far as to end every printed study unit ("letter") with the phrase "Yours faithfully, H. S. Hermod" and today every study unit issued by Hamburger

1 On this research project see further a paper by Ulla Rosberg.

2 ICCE Proceedings 1965 p. 83.

Fern-Lehrinstitut begins by the address "Lieber Studienfreund" (*Dear Student*)[1]. In Germany and Scandinavia the term "letter" (Brief; brev) is still universally used in this sense. Very often "assignment" is used in English-speaking countries to denote such study units. However, this involves some danger of misunderstanding as "assignment" may be interpreted as denoting the test (task set) at the end of the unit. The same objection applies to the word *lesson*, which I used to recommend.[2]

The National Home Study Council in the U.S.A. has published a list of English terms used in connection with correspondence teaching (The Home Study Letter No. 32, April 1955) and the European Council for Education by Correspondence is planning a similar but multilingual list.

Subject-Matter and Student Body

What is the proper and profitable field for correspondence education is judged differently in different parts of the world. The Anglo-Saxon tradition has favoured the application of the method at university and comparable levels. Thus it has long been accepted that correspondence studies are a suitable means of preparing oneself for an external London University degree, the universities in the United States and Canada normally accept and sometimes encourage their students to take correspondence courses for certain "credits", and for some English professional examinations correspondence teaching offers the most easily available training method.

In Sweden, otherwise a stronghold of European correspondence education, the application of the method to university teaching was not introduced until the beginning of the 1950's and was then regarded with misgiving and suspicion by a great many university people. The negative reactions seem to have disappeared by now owing to favourable

1 Delling in Epistolodidaktika June 1966 p. 216.

2 Dr. Emil Østlyngen of NKS, Oslo, has kindly pointed out to me that also in another sense *lesson* is far from unequivocal. A study unit in a foreign language may be (and has been) said to consist of two or more lessons.

experiences, but even today all through Scandinavia general education, grammar-school studies, medium-level occupational subjects (commercial and technical) and foreign languages are regarded as the prime field of action of correspondence teaching whereas university studies constitute still only a secondary application of the method.

So far there are few Europeans apt to apply correspondence teaching to the education of primary-school children, i.e. to those under 11, but in Australia and New Zealand this is considered not only a necessary and possible but also an effective method.

The subject-matter taught by correspondence also varies in different parts of the world. Elementary subjects like arithmetic, the mother tongue, beginners' courses in a second language, simple agricultural subjects etc. used to predominate and do so still in many countries, whereas now in many highly developed countries more advanced studies play a greater part. Typical of this latter trend are subjects like statistics, automatic data processing, advanced mathematics, electronics, business administration, further studies in languages and the type of subject that makes it possible for the individual to keep abreast of new procedures in automation and technological developments in general.

Today when in the teaching of foreign languages the importance of the oral method is stressed, the use of tape recordings and gramophone records is considered a necessary supplement to correspondence courses devoted to language study, and in some countries the basically written approach has detracted from the prestige of the correspondence method in this field. In others, like those of Scandinavia, where correspondence study has for several decades been a usual way of learning foreign languages the effect of the insistence on oral training has merely increased the use of supplementary technical auxiliary means with correspondence courses.

In the countries where correspondence students have normally joined short residential courses immediately before certain major examinations, the teaching of the natural sciences and technical subjects has never been considered unsuited for the correspondence method, whereas in others stressing the autonomous character of correspondence education more principally there is more hesitation. The training of engineers by correspondence is thus an entirely accepted thing in Sweden, is being gradually introduced in Norway and Denmark, but is still widely considered either an impossibility or an unpracticable arrangement in Western Germany. In Eastern Germany so-called self-teaching courses

(see above p. 10 f.) constitute the basis of an extensive teaching of engineering subjects (supplemented not only by residential courses but also by oral so-called consultations).

The conclusion to be drawn from this is that practically any subject at practically any level can be taught by correspondence. The evident exceptions are the practical skills which require exercises of a kind that need other auxiliaries than those that each student can procure. The practical ability of mining or brick-laying cannot be trained by correspondence only. Before the invention of the tape-recorder this was true about elocution and — in spite of gramophone records and phonetic transcription — to some extent about the teaching of pronunciation. On the other hand such practical skills as type-writing and shorthand can be and have been widely learnt successfully by correspondence.

In my view it is wholly unprofitable to define certain subjects as suitable and others as unsuitable for correspondence study. It is sufficient to say that it normally suits all theoretical and some practical subjects. Then, of course, like all schooling, it sometimes needs supplementing by means of practical experiences in a workshop, an office, a laboratory or a comparable place.

In many countries correspondence education began as a method open to and used by gifted and energetic grown-up men and women who could not receive a proper schooling in any other way. They chose correspondence education for the simple reason that they had practically no other choice either because they could not afford to spend time at an ordinary school or because for family or health reasons they could not attend oral classes. Of course, these groups still exist everywhere and dominate in many countries — often outstanding students, eager to learn and efficient in their work — but in highly developed countries they form a smaller portion of the student body than they used to.

Among the new categories of students are large groups who have already a good general education and are professionally established, e.g. responsible employees in business or administration who study subjects they need know more about or which they feel a wish to pursue for professional or personal reason. On the other hand these new groups of students may include more or less bright schoolboys and schoolgirls who take correspondence courses not because they are interested in them but because they have to (as part of the school curriculum or as a means of improving their standard); they also include apprentices

and other employees who are instructed by their employers to study in this way.

For all the new groups referred to here it is felt to be absolutely essential that their studies should not be more time-consuming than necessary. None of them are prepared to spend time and work on things that they do not immediately realize the importance of; nor are they willing to follow an unnecessarily complicated path. They are much more aware of what their studies cost them in time and energy than earlier generations of students were.

These attitudes have to some extent caused correspondence educators to pay particular attention to motivating devices and the teaching methods and will have to do so even more. At the same time as the demands for immediate effectiveness by the new groups of students are considered, it is in my opinion essential that the educational aspects are not lost in favour of mere training.

The Methods of Teaching by Correspondence

Aims and Possibilities

While on the one hand it is important that measures taken to develop the methods of teaching by correspondence improve efficiency in the teaching of facts and skills, it is even more essential that purely educational purposes are favoured. Such purposes are the promoting of a good technique of study, the methods of finding and utilizing various sources of knowledge, critical reading and independent judgment.

The aim of correspondence instruction does not differ from that of oral teaching. All serious theoretical study is meant to lead to

1 exact and solid knowledge of facts

2 clearness in the comprehension and definition of concepts with insight into logical connections, resulting in

3 synoptic knowledge and

4 ability to apply the knowledge acquired, all of which constitutes the necessary basis for

5 further studies, to which any kind of teaching should be able to stimulate the students.

Though the aims of correspondence instruction and that of oral teaching are the same, the incitements, motives and methods differ.

What used to lead and still to some extent leads many correspondence students to adopt this method of study is no doubt the absence of suitable oral tuition or such conditions as make it difficult to benefit from the oral tuition which may be available. In a considerable number of cases this means that the student is, or feels, isolated in his work. Authors of correspondence courses have to give attention to these circumstances and counterbalance them in a suitable way. Some students for reasons of disposition and temper genuinely prefer working on their own by means of the correspondence method to any other instructional system. It is not known what proportion of the students take correspondence courses because they prefer this type of study. It is my feeling, based on experiences in Sweden, that at least 50 % belong to this group.

While discussing the handicap of isolation — which nevertheless to not a few students undoubtedly *is* a handicap — Rayner hints that contributions of general value to education are likely to arise from the measures taken to meet the needs of students subjected to isolation, just as education in general "owes much to methods worked out with children suffering from disabilities of various kinds" (Rayner p. 89).[1] In the beginning correspondence instruction was considered an inferior but, lacking better alternatives, acceptable substitute for oral teaching. Later developments in its methods have to a considerable extent limited — if not eliminated — the validity of the objections originally raised against it. Apart from this, however, it has proved to possess certain inherent advantages which may be regarded as compensations for what is to some students the handicap of isolation.[2] The experiences of

1 It is interesting to note that some deaf pre-school children are taught by correspondence. Cf. Bennett and Lowell.

2 In this context I leave out of account the natural practical advantage that the correspondence method implies to grown-up students by providing teaching in the students' home with experienced help always available. Cf. on this aspect the Norwegian Government's pamphlet Om lov om brevskoler. On the discussion of the "handicap of isolation" I wish to refer my readers to Graff in the ICCE Proceedings 1965 p. 75.

Australia and New Zealand, where correspondence teaching plays an important part in the regular education of children, demonstrate this beyond a doubt. Naturally elsewhere, too, correspondence tutors and students, i.e. those who have personal experience of the method, are fully aware of this fact. While stressing that Rayner discusses the teaching of children at school, I should like to direct my readers' attention to the following extract from his report on correspondence education in Australia and New Zealand:

"Very important elements in a child's education come from his personal contact with his teachers and with his fellows. The opportunities which the school affords, or should afford, for the boy or girl to learn to co-operate with others, to assume responsibility among equals, to subordinate self to loyalty for the team or the school, to exercise the privilege of leadership, to enjoy the pleasures of companionship and the thrill of competition — these are some of the valuable social experiences normally denied to children who cannot attend school. Similarly, the city child has available to him advantages of an informal character through opportunities of first-hand observation of the commercial, political, scientific, and artistic aspects of modern community life.

But the matter is not nearly as one-sided as it appears, even if we overlook the sad failure of many schools to realize effectively their opportunities for character building and for making use of the wealth of the child's every-day experiences. Teaching children in classes has certain disadvantages, apart from the obvious difficulty of catering for the requirements and abilities of the children as individuals. It is not going too far to say that much of our class teaching places a discount on independent thinking and acting. The member of a class must usually be a conformist if he is to avoid troubles and difficulties. It is often sufficient if some one member of the class provides the correct "answer" to a question. For perhaps one half of the class the process of thinking through to the correct solution is short-circuited. In the great majority of cases the question itself is a teacher-made one. The child who does not know is not at all anxious to announce, or even to admit, the fact, since, even if he is fortunate enough to have a teacher who inspires confidence of this nature, he does not wish to appear to disadvantage before his fellows.

The child whose education takes place as does that of correspondence pupils is not subjected to the constant temptation to adopt the ideas

and solution of others. Intellectually, he must stand on his own feet. He learns to look to books and printed matter rather than to word of mouth for guidance in forming his ideas. One must suppose, then, that these habits counteract to some extent the disadvantages of isolation from a class group. It is interesting to note that correspondence pupils who have passed on to high schools have been reported to show initiative and perseverance."[1]

Experiences gathered elsewhere, e.g. in connection with the external degree examinations of London University and Swedish university and school examinations strongly confirm Reyner's suggestion. On measures taken to secure the independence-favouring effect of correspondence education see below p. 25.

The Construction of a Correspondence Lesson and a Correspondence Course

It has been suggested above that a correspondence course differs from a textbook in that it actually teaches on its own without relying on oral exposition by an instructor. In any case it must be expected to do so, and if it does not it is a failure as a correspondence course, even if it contains a wealth of correct and valuable information in logical order and as a whole can be regarded as a useful textbook.

The Planning and Arrangement of the Teaching Matter

The difference between a correspondence course and a textbook in this respect appears clearly when the planning of some efficient correspondence courses is examined. A teacher giving oral instruction does not try to teach his students more at a time of a given section of his subject than he expects them to grasp and remember; and the author of a correspondence course has to observe the same principle to make it possible for the students, i.e. his readers, to digest and benefit from what he has written. In some subjects, e.g. languages and others where

1 Rayner pp. 89—90.

the teaching aims at providing the students with certain practical attainments, this leads authors to adopt a kind of concentric method. This method is rarely practicable in textbooks, where the division of the material more strictly follows logical lines.

Common Experiences

Attempts have been made in several schools to epitomize the experiences made of the best possible planning of a correspondence course. As an example of what conclusions have been reached on suitable lesson sequences I wish to refer to the recommendations of Dr. Robert Allen, Dean of the Division of Continuing Education in the University of Miami. As a general pattern he suggests:

1 Lesson Number, Title + Introductory Remarks

2 Review Self-check Exercise to be done prior to studying the new instruction — intended as a "warmup"

3 New Instruction

4 "Home Study Quiz" — self-check examination on the new instruction

5 Test Paper

6 Home Tutor — a sheet intended to encourage students to indicate their questions or problems (on this see further p. 56).

In many correspondence courses — as hinted at above — the author widens the knowledge of his students as it were in concentric circles. He gives them one little part of the difficult matter at a time. He makes them consolidate their newly acquired knowledge in various ways (on which see below), supports it by bringing in secondary material both of a motivating and of an elucidating type, and also checks their knowledge and proficiency before he brings in new difficult teaching (and learning) matter. Thus one body of problems may be dealt with in several lessons along with various other parts of the subject. This simply means that the author identifies himself with an instructor teaching orally, who has to consider the receptivity of his students. The method described is applied above all in the planning of language courses, in which problems of text analysis, phraseology, idiomatic expressions, grammar, style, phonetics etc. are often dealt with concentrically. However, fundamentally the same method is found in

courses of mathematics (where, e.g., algebra and geometry may be taught side by side) and of physics and chemistry (where theory, discussion of experiments and the solution of problems may be brought together). In some cases the various aspects of a subject are considered in different courses, the lessons of which alternate in the student's programme of study. From the point of view of teaching method, this application of concentric instruction is only superficially different from the one described above.

On the size of study units see above pp. 12—13.

New Approaches

I assume that the procedure described, which is based on the author and editor identifying themselves with teachers providing oral tuition, is the one followed in the production of most correspondence courses once the rough pre-planning concerning the purpose, goal and the approximate size of the course is over. However, some correspondence educators now tend to insist on a more detailed analysis of the exact aims of the course expressed in terms of the exact knowledge and skills required of the student after he has completed the course. After such a full analysis is available it is profitable to formulate end-of-course examination questions and then to build up a complete instruction plan systematically leading via the various study-units, exercises and tests to the desired end, i.e. to the mastery of the knowledge and skills required to answer the examination questions and solve the problems concerned entirely correctly. Revisions of drafts and published editions should be based on statistical analyses of the results yielded. A systematic evaluation scheme is a necessary component in this procedure for producing correspondence courses.

The main difference between this production method and the one first described is that this relies much less on the author's pedagogical intuition than the former. This intuition is mainly used for the purpose of finding suitable formulations but not as in the former case in deciding what material shall be included or omitted. If in the deciding of the exact aims of the course all the proper educational and practical points are considered, there can be little doubt that this procedure, which normally engages a team of subject-specialists and educationists, is superior to the intuitive method.

As far as I can judge, the more scholarly of the two methods has

so far been applied too little. I do not think there can be any doubt that it will be much more practised within the next few decades. It is interesting to note that it agrees very closely with the methods used in producing programmed instruction.

Programmed instruction has been studied and experiments in it have been made in many correspondence schools. This is natural as there are great similarities between correspondence teaching and programmed instruction. Particularly the possibility of providing immediate reinforcements in programmed texts has attracted the attention of correspondence educators. This type of teaching seems to be of limited but not negligible use in correspondence education. Most students seem to find it boring to study very long programmes. Further, as these direct the students in a very detailed way I do not think their educational value is always up to the standards required: they do not normally develop students' independence and capacity to work on their own, but they do teach efficiently. For this reason some schools experiment with programmes inserted in ordinary correspondence courses as auxiliary measures helping students to grasp and learn complicated things. This has in my experience proved valuable in mathematics. Such programmes, either of the linear or the branching type, can also be used as extra instruction sheets which are sent to students who have not succeeded in correctly solving a problem or in completing an assignment. On the use of procedures inspired by the techniques of programmed instruction also in repetitions see below p. 38.

I am convinced that Larsson[1] is right in pointing out that the most valuable thing correspondence educators can get from programmed instruction is not the programming method itself "but its very core — the empirical evaluation method."

The type of programming that is required for computer-assisted instruction is briefly dealt with below under *Administrative Problems.*

1 Programmed Instruction in Correspondence Study, CEC Yearbook 1965. On comparisons between correspondence teaching and programmed instruction see Childs in ICCE Proceedings 1965 reporting on experiments by Sjogren and others. Cf. further Graff, Estabrooke, Edström, Helen Kempfer, Larsson and Paddon, all in the ICCE Proceedings 1965.

Independent Courses and Courses Based on Textbooks

Many schools seem to feel strongly that independent correspondence courses which provide all the teaching material are superior to those based on textbooks.[1] From the point of view of efficiency this is probably true as regards many elementary courses (perhaps in some subjects covering the stage up to university entrance qualifications and parallel stages in practical subjects), but at least as soon as the university stage has been reached it is necessary to make the student read several books making comparisons and applying considerably more of a critical approach. In so far as we consider critical judgment an essential aim of education — and as far as I can see we have to — this may make course editors adopt a similar method at the lower stages or in other suitable ways encourage the students to develop critical minds.

In the cases when textbooks are used the correspondence lessons supplement them

1 by supplying any material required by the syllabus and not available in the textbooks

2 by supplying extra (or more suitable) illustrations and examples

3 by providing diagrams or pictures to clarify instruction or stimulate interest

4 by correlating topics where possible with recommended library reading

5 by recapitulating material periodically and setting progress tests (exercises, self-check tests, repetitive questions)

6 by providing test questions and test problems by means of which the students come into contact with their instructors and make it

1 Cf. the report of the study group on the preparation of correspondence courses at the international conference on correspondence education at the University of Nebraska in 1958: "The ideal procedure would be to have a self-teaching text prepared by the correspondence center. The principal advantage of this is that it points directly toward the objectives the center wishes to achieve. Moreover, it is possible to include directions at the exact point where they are needed" (ICCE Proceedings 1948 p. 41).

possible for these to analyse the individual student's difficulties and give him appropriate assistance

7 by generally making the reading of the textbooks easier and more efficient.[1]

The Use of Subsidiary Material

Most educators no doubt agree that it is not enough to teach the actual learning matter. Students' independence and critical judgment must be trained. For that reason it is advisable that correspondence schools should try to stimulate students to trace information in books of various kinds, in periodicals, recordings etc. To my mind there is too little of this in normal correspondence education, but sometimes schools provide not only a correspondence course but along with it a 'parcel' of further reading material (articles, extracts from recent papers, etc.). Students are encouraged to compare the different sources. From a practical point of view the only way of making them do this is by asking questions the answering of which requires parallel reading and stimulates doubts and inquisitiveness. In future, correspondence education can no doubt stimulate studies of this kind to a greater extent than is now common practice.

For the study of certain subjects it is necessary to have some equipment for practical exercises. This is particularly true for science subjects which generally necessitate a certain amount of laboratory work. For elementary experiments the proper material can be — and often is — distributed to students by the correspondence schools in the form of laboratory kits, but for advanced studies laboratories and qualified teachers must normally be made available. This is done in various ways, some schools organizing laboratory courses of their own either on their premises or elsewhere. Cf. below pp. 63—65.

For language study gramophone records of the text contained in the courses is a useful means of illustrating by good native voices the proper pronunciation and intonation. Many schools provide such gramophone records. Of a similar kind are tape recordings, but tape recorders are as yet less common than gramophones in most countries. Consequently

1 I owe part of this observation to Mr. E. N. Le Petit, Headmaster of the Department of Education Correspondence School, Wellington, New Zealand.

gramophones — though less useful than tape recorders, which can be used for the student's own recordings and the tutor's comments as well (cf. p. 9 above) — still seem to predominate.

Wireless and TV programmes seem to be excellent supplements to correspondence teaching. Interesting experiences have been made in various parts of the world, particularly in Japan, Australia, New Zealand, the USA and Great Britain. Integrated correspondence and wireless courses are being introduced in Sweden, where also some experiences of this kind of teaching have already been obtained. Advanced audio-visual aids can offer valuable support to correspondence education. In spite of the results achieved through modern technological developments (two-way TV, the so-called Educasting system of the International Correspondence Schools in Scranton, Pennsylvania, etc.), only very modest use has been made of such aids, mainly for reasons of cost.

Some experiments have been closely studied. Childs reports on these that "correspondence study alone appears to produce better results than are secured when correspondence study is combined with television or motion pictures" (ICCE Proceedings 1965 p. 81). This amazing conclusion based on study projects carried on at the Universities of Nebraska, Wisconsin and Michigan should, until further research work has been done, make us cautious about regarding TV and films as the self-evidently ideal supplements to correspondence education.

Style and Language

As a rule ordinary oral teaching does not consist of lectures read from a manuscript and in the cases such teaching does occur it generally constitutes only part of the instruction, in which seminars and other classroom discussions, tutorials, etc., play an important part. In fact, a considerable portion of all oral tuition can rightly be described as didactic conversation.

In a great number of successful correspondence courses the atmosphere and style of such conversation is found. In the author's view this is a great advantage, as in this way the correspondence lesson, which is an important mouthpiece of the school, becomes easily readable, attractive and stimulating, and further contributes to creating a friendly tone. This is no plea for an over-chatty style. However, it must be borne in mind that too compact a style of writing, in which the reader must be on the look-out for important information in each qualifying word or

clause, is tiring to read. It is of great value for the student if particularly important points are expressly said to be so or are properly stressed by other means, and it is not less useful if it said about certain sections that it is sufficient to read them through and follow their line of thought without memorizing them.

It is typical of the style of didactic conversation that advice is given on how to tackle problems, what to learn more or less carefully, how to connect items of knowledge discussed in different units (books, subjects etc.), and this also characterizes many good correspondence courses. It seems to me that advice and suggestions should preferably be expressed in phrases of personal address, such as "When you have read these paragraphs, make sure that...", "Compare what you have now read with...".

Everybody agrees that all informative writing should be lucid, and naturally perfect lucidity must characterize a correspondence course. Easy style with somewhat colloquial language and without unnecessarily abstract or otherwise difficult expressions makes the course attractive to read and easy to follow. Thus suitable style can to a great extent contribute to making a course efficient.

A few attempts have been made to find out by experiments what kind of style is the most effective in correspondence courses, but as far as I know they have yielded no positive result.[1]

Illustrations

There is nowadays a strong tendency in various parts of the world to include many pictures in instructional literature. Sometimes pictures in correspondence courses simply serve the purpose of making a page look attractive, which is supposed to be of some importance for the student's attitude to his work. In other cases a picture separates blocks of texts in a suitable way and is thus a typographical means of making the lesson more easily legible.

In most cases, however, illustrations are ordinary means of instruction. They are there to show the student something that is essential. To point out what is most important, many schools prefer sketches drawn for the purpose of the course to photographs of a corresponding type.

1 Cf. Di Vesta.

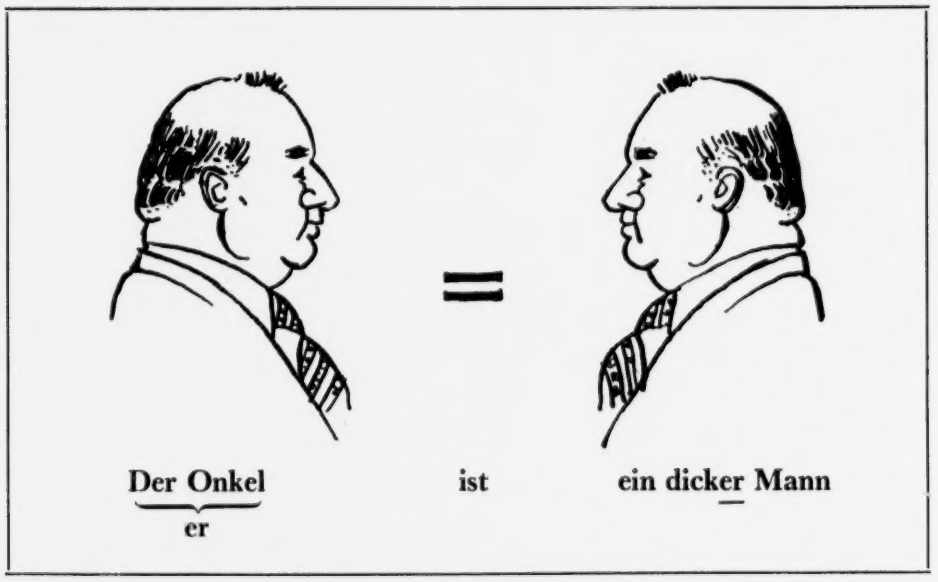


Illustration 1. In a Danish course the German nominative form of a predicative noun qualifier is explained by showing the identity between the subject and its qualifier (Danmarks Brevskole)

However, even in scientific subjects photographs must sometimes be used so that machinery, tools, laboratory equipment etc. may be shown in a perfectly realistic way. For the purpose of showing a process of happenings, e.g. how a machine works, drawings often, however, seem to be superior.

It is of considerable importance that the text given under, over or beside the pictures is to the point. If the author or the editor contents himself with giving the number of the illustration referring to the lesson he misses an excellent opportunity of teaching (as opposed to writing a handbook). Experience shows that there are students who look at the pictures only perfunctorily in connection with the text they illustrate unless the pictures are taken as the starting-point for expositions or exercises. Fairly full comments on every illustration where what has been said elsewhere in the lesson is expressed in a new way based on the illustration give valuable repetition and help the student to retain a vivid mental picture of the point in question. Figures, letters, arrows and other markings in the pictures are also valuable study helps, by which a student can avoid unnecessarily abstract learning methods. Sometimes it is profitable to base the whole of a discussion on an illustration (cf. illustration 1).

Often enough it is both possible and useful to teach as much by

illustrations as by the written word. Examples of this are shown in illustrations 2 and 3, both taken from a Swedish course of mathematics. The pictures in illustration 3 showing a round loaf of bread being carved elucidate the difference between a circle and an ellipse. In illustration 2 the students are taught how to divide an angle into two equal parts. This is not done by a single drawing plus a theoretical description but by five consecutive drawings, each provided with a direction to the student telling him or her what exactly he or she must do.

Today tables, diagrams and figures are used everywhere to a greater extent than before. This should induce correspondence educators — and has to some extent done so — to try systematically to train students in the art of interpreting and themselves using such auxiliaries.

Typography

Opinions differ considerably as to the typography best suited for correspondence courses. Some research has been done to find out what reading surfaces are easiest for the eye, however. The variety in the length of lines in existing correspondence courses show a little of the experiments which have been made by different schools. The size of printing style, the type and place of headings and illustrations are now decided more by the course editor's practical experience and aesthetic feeling than by results of actual research. According to recent research reports, the ideal length of lines in a text is 20—22 cicero (in two-column pages 14 cicero per line).[1] Some schools are growing increasingly anxious to keep to that size.

Typography can be, and is to some extent, an essential means of making reading easier and helping the students to find out what is most important. Thus it is certainly justifiable to regard it as a pedagogical instrument.[2]

1 Edfeldt.

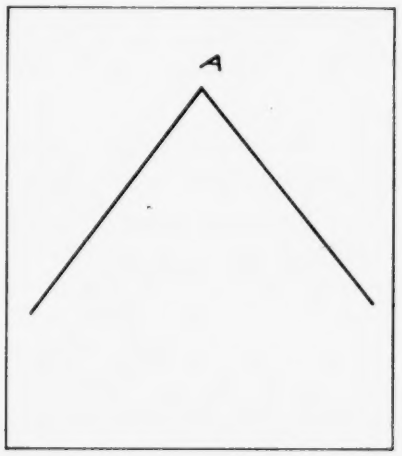
2 Cf. the ICCE Proceedings 1948 p. 49: "The appearance of the course syllabus (or self-teaching text) is important. The syllabus constitutes the pupil's first contact with the subject he is to study. His original impressions, which are important in shaping his attitude toward the course, are formed when he examines the syllabus. Neatness, legibility, careful organization of material so that pages are well-balanced, readability, and the occasional use of illustrations are factors of importance in the construction of course syllabi."

Några enkla geometriska konstruktionsuppgifter

Hur man delar en vinkel i två lika stora delar

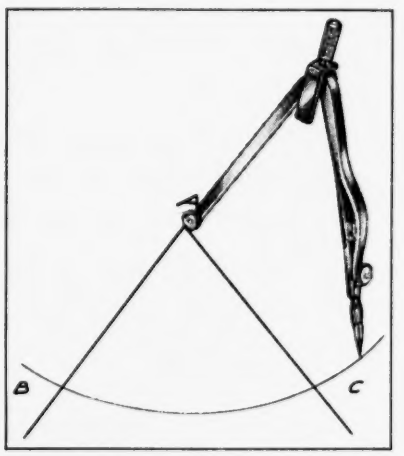
Om man ställs inför problemet att dela en given vinkel i två lika stora delar, kan man givetvis klara av det med hjälp av gradskivan. Denna metod är dock inte tillräckligt exakt vid många tillämpningsuppgifter. Det finns en exakt metod, som vi redogör för här nedan.

❶



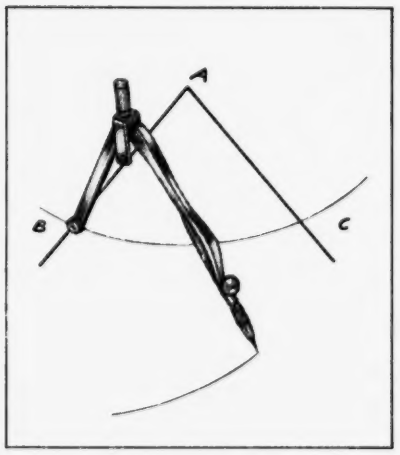
Den spetsiga vinkeln vid A ska delas i två lika stora delar.

❷



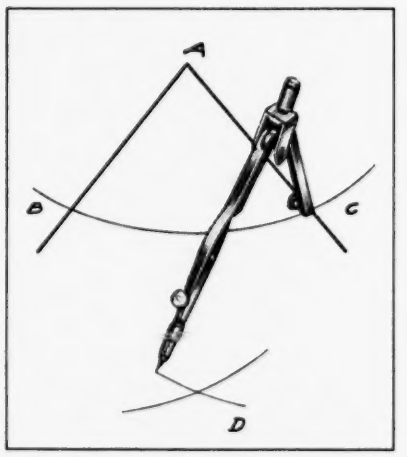
Sätt passarspetsen i A och slå en cirkelbåge, som skär de båda vinkelbenen. Vi kallar skärningspunkterna för B och C.

❸



Sätt sedan passarspetsen i B och slå en båge med godtycklig radie, som dock inte får vara alltför liten.

❹

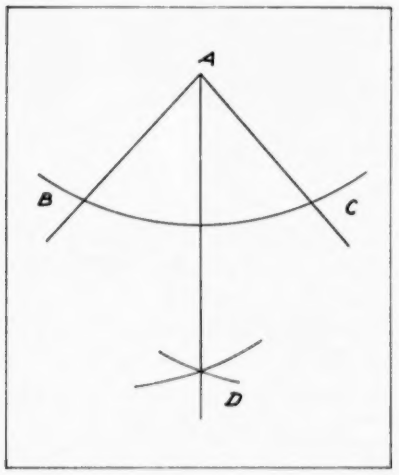


Behåll måttet i passaren och flytta passarspetsen till punkten C. Slå en cirkelbåge med lika stor radie som i bild 3. Om de båda bågarna inte skulle skära varandra, har Ni valt en alltför liten radie i cirkelbågarna.

Den metod, som vi har beskrivit i denna bildserie, kan Ni också använda, när Ni ska dela en vinkel i 4 lika stora delar. Dela då först vinkeln i *två* lika delar. Fortsätt sedan konstruktionen och dela var och en av dessa vinklar i *två* lika delar.

På så sätt uppkommer *fyra* lika stora vinklar. Att dela en vinkel i *tre* lika stora delar med hjälp av passare och linjal är dock *omöjligt*. Med gradskiva kan man emellertid "praktiskt" utföra konstruktionen.

❺



Skärningspunkten mellan cirkelbågarna kallas D. Sammanbindningslinjen mellan A och D delar den spetsiga vinkeln vid A mitt itu.

Illustration 2. A series of drawings showing how an angle is divided into two equal parts (from an elementary course in mathematics; HERMODS-NKI)

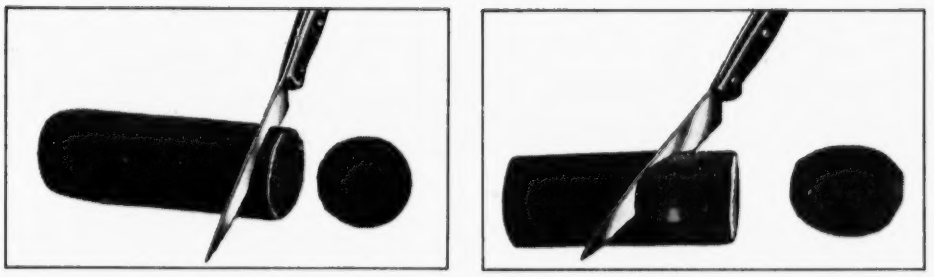
Publishers and advertisers have made all students increasingly aware of the value of good typography, fine illustrations and attractive production. Also for this reason attention must be given to the readability and attractiveness of courses so that the appearance of the instruction material does not disappoint the student at first sight.

I wish to stress, however, that the demand for typographically pleasing courses must always be subordinated to the teaching method. The lay-out and general production should above all make the study easy and motivating.

The financial aspect cannot be neglected, unfortunately. Many schools resort to offset printing of typed prototypes if the editions are small and manage to produce attractive courses meeting all reasonable demands in that way. Letter-press printing is often used only for editions of at least 2,000 copies.

Summing-ups and Study Helps

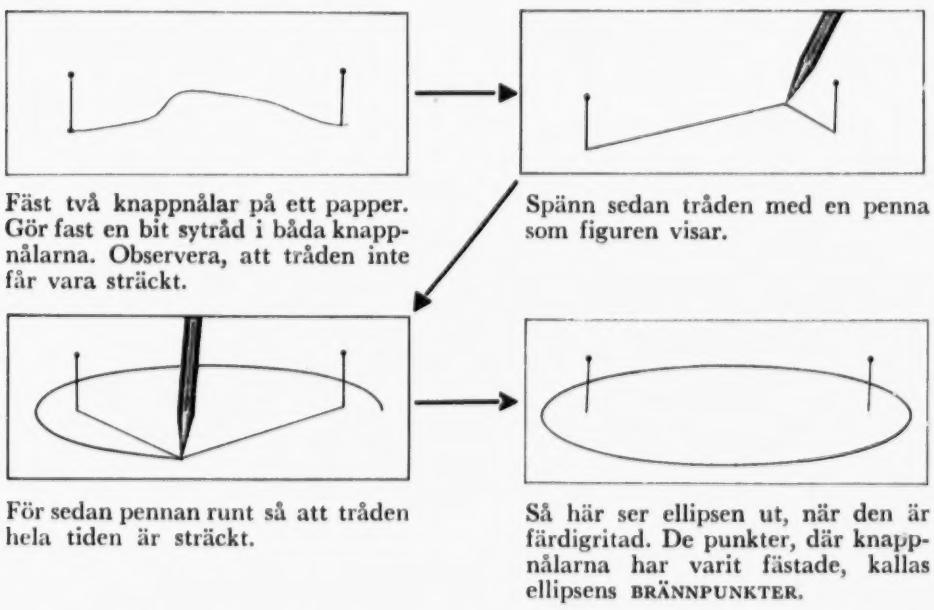
Summing-ups and other study helps are becoming increasingly common in all kinds of instructional literature. Above all, however, they are methods of teaching typical of correspondence courses, in which



Ellipser

Vi ska experimentera ett ögonblick med en rundkavring. Först skär vi kavringen på "vanligt" sätt. Då blir snittytan en CIRKEL. Sedan skär vi "snett". Snittytan blir i detta fall inte cirkelformad. Snittytan är en ELLIPS.

I den här kursen ska vi syssla ytterst litet med ELLIPSER, men Ni måste ändå känna till begreppet, eftersom det återkommer i den sista studieenheten i kursen. Hur ska man då definiera en ellips? Det är ganska svårt, men vi har god hjälp av följande bildsvit, som visar hur man kan konstruera en ellips med hjälp av en tråd, en penna och två knappnålar.



Fäst två knappnålar på ett papper. Gör fast en bit sytråd i båda knappnålarna. Observera, att tråden inte får vara sträckt.

Spänn sedan tråden med en penna som figuren visar.

För sedan pennan runt så att tråden hela tiden är sträckt.

Så här ser ellipsen ut, när den är färdigritad. De punkter, där knappnålarna har varit fästade, kallas ellipsens BRÄNNPUNKTER.

Eftersom tråden varit sträckt under hela tiden som vi har ritat ellipsen, har tydligen varje punkt på ellipsens PERIFERI den egenskapen, att summan av dess avstånd till de båda brännpunkterna hela tiden är densamma = trådens längd. En ellips kan alltså definieras så här:

> En ellips är mängden av alla punkter, för vilka det gäller att summan av avstånden till två givna punkter är konstant.

Illustration 3. An example of the kind of illustrations that is useful in the teaching of mathematics (HERMODS-NKI)

summing-ups, *inter alia*, should appear — and normally do appear — abundantly. In the cases where a concentric method is used they are indispensable to the students who need systematized epitomes to be able to disentangle problematic points of different kinds.

Here again we come across a procedure parallel with one applied in oral teaching. An efficient instructor in class does not allow his pupils to collect at random the facts which are to be committed to memory. He helps them to sort out what is essential, define the chief outlines to be learnt, and grasp the connection. He does this either by providing a systematized survey of the main points or by asking such questions as stimulate the students to produce a clear and logical arrangement of the items of knowledge relevant to the branch of the subject which is to be summarized. Further, he makes sure that the students draw conclusions which are correct and fruitful. This is exactly what the author of a correspondence course and the correspondence instructor have to do, too. How it is done by means of exercises of various kinds, correcting methods, etc., will be discussed below. However, it is essential to recognize in this context that the points indicated affect not only teaching methods but also the technique of study that the students should be encouraged to develop.

Students' Technique of Study

It is important to all students to acquire good reading habits which enable them to learn quickly and memorize efficiently. In oral teaching shortcomings in the students' reading technique may be counter-balanced by his listening to lectures and discussions and further to the teacher's activity in engaging him in didactic conversation. Correspondence students must either completely or partly do without this neutralizing effect. Thus a good technique of study is of even greater importance to them than to other students.

It is generally recognized that the art of reading encompasses the capacity of finding out quickly what is most essential. Words and phrases, which are so essential that they may be regarded as keys to the text, are to be underlined or otherwise marked. A useful check that the reader has really marked off the main points is to read the markings only; if these have been made adroitly the marked "key-words" or "key-phrases" by themselves give a clear concept of the contents of the

text.[1] Other means of making one's reading efficient from the memorizing point of view is to add numbers (1, 2, 3, etc.) to the words denoting phenomena which are to be remembered, to write headings of one's own in the margin, to make a written survey of the text by producing a skeleton essay consisting only of headings and sub-headings showing the composition of the text, etc. Various suggestions based on these or similar principles are to be found in modern guides to good study methods.

The special importance that an efficient technique of study has to correspondence students can hardly be said to have been satisfactorily recognized. It is true that correspondence schools sometimes send general recommendations and directions in this respect to their students, but it would no doubt be wise to do more.

In university circles it is sometimes said about correspondence studies preparing for a university degree that they require no special directions as they should not differ at all from ordinary university teaching. In my view special measures are needed for the correspondence student to compensate for the advice and recommendations ordinary university students receive in tutorials and seminars.

An attempt to give special emphasis to the importance of good methods of study has been made by HERMODS-NKI in Sweden. Thus a special correspondence course on the technique of study has been produced. It includes units on note-taking, précis-writing, the reading of tables, diagrams and maps, the use of library catalogues, skimming and quick reading, and is supplemented by programmed sections and gramophone records.[2] Further a film designed for class instruction as an introduction to supervised correspondence study has been produced as a result of team work in the school and the technical assistance of a cinema studio.[3] For the same purpose a detailed guide to a thorough study of three selected correspondence lessons intended for so-called comprehensive schools following the methods of the film, has been published by the same school.[4]

1 I owe this observation to Mr. Gunnar Gaddén and Mr. Helmer Larsson, who have put it forward in a film on the technique of study produced by HERMODS-NKI.

2 Studieteknik (NKI-skolan 1965).

3 "Den rätta tekniken" (Hermods-Focus film 1958).

4 "Hur Du läser en hermodskurs" (Hermods 1965).

Means to Help Students Secure Knowledge Acquired

Repetitions and Introductory Surveys

Anyone who writes a book or an article is apt to avoid repeating what he has already written. This is a stylistic trend which is entirely contrary to every teacher's desire to make his students learn by repetition. It is possible to no instructor continually without repetition to teach new material and thus constantly to heap item after item on the students' memory. If he tries, the students find it difficult to follow him, they learn little and desultorily, and many — probably most — of them will show a tendency to lose the thread. Naturally, this is partly due to the fact that highly receptive, really reflecting model students are few.

The nature of the average student, his receptivity and degree of tenacity, always dictates the instructor's proceeding. The need for repetition is universally recognized as far as the normal student is concerned. The correspondence student is no exception. Every author of correspondence courses must be aware that the average student, when he approaches the end of a course, has only hazy notions of what he learnt from the first few lessons unless he is reminded again and again. It is necessary to return to all really important points in one way or another.

Sometimes it is sufficient for the author of a course or for the individual student's instructor to write, e.g. "Before you continue with the next chapter it is necessary for you carefully to re-read pp. x—y." On the other hand it is often suitable to write a repetitive chapter, in which specially important facts are emphasized with reference to what has been discussed in sections studied already.

In many cases it is preferable to use other means. Thus it is possible to tackle a problem from a new angle to bring about repetition. This is what happens when for instance in historical expositions, a horizontal approach in a repetitive chapter or in exercises follows on a vertical representation of facts. In language teaching a similar method can be applied. When discussing a particular phenomenon it is possible to start out from the expressions in the foreign language, from those in the language of the student or from the concept itself (in connection with pictures, e.g.). Homonyms and synonyms can both be used as starting-points for elucidating discussions of the same phenomenon.

Grundlegendes Rechnen

Geometrie

1. Die Geometrie ist die Lehre von Raum. Teilgebiete der Geometrie sind

❶ Planimetrie
❷ Stereometrie
❸ Trigonometrie

Planimetrie

2. Die einfachsten geometrischen Grundbegriffe in der Ebene sind

❶ Punkt
❷ Gerade
❸ Strecke
❹ Winkel

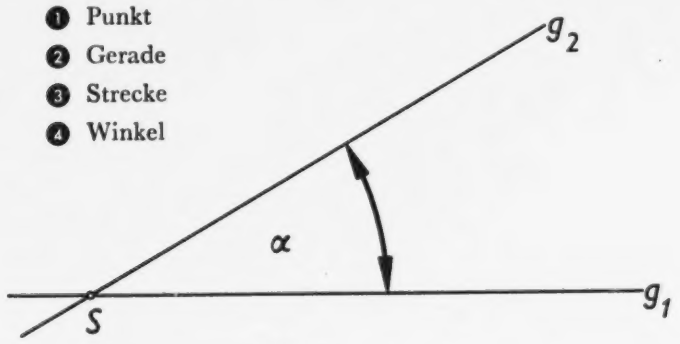


Abb. 1: Winkel α zwischen den Geraden g_1 und g_2

Winkel werden in Grad gemessen: Eine volle Drehung entspricht einem Vollwinkel von 360°.

3. Mit Hilfe der einfachen geometrischen Grundbegriffe: Punkt, Gerade, Strecke, Winkel lassen sich zusammengesetzte geometrische Figuren bilden.

❶ Rechter Winkel: Ein Winkel von 90° heißt rechter Winkel.
❷ Lot in einem Punkt P einer Geraden g
❸ Lot vom Punkt P auf eine Gerade g
❹ Abstand zweier Punkte
❺ Abstand eines Punktes von einer Geraden
❻ Parallelen:

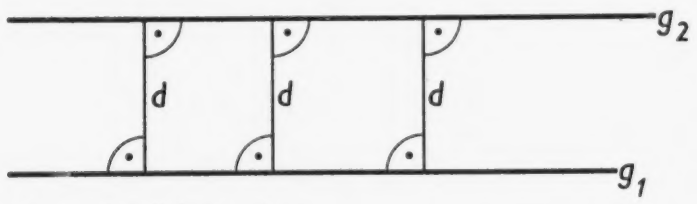


Abb. 2: Parallele Geraden

4. Unter einer geometrischen Konstruktion versteht man das Auffinden von gesuchten Punkten oder Linien aus gegebenen Punkten oder Linien durch Zeichnung. Grundkonstruktionen sind:

❶ Errichten des Lots in einem Punkt P einer Geraden g
❷ Fällen des Lots von einem Punkt P auf eine Gerade g
❸ Halbierung einer Strecke (Konstruktion des Mittellots)
❹ Halbierung eines Winkels (Konstruktion der Winkelhalbierenden):
❺ Parallelverschiebung
❻ Teilung einer Strecke in gleiche Teile

Illustration 4. Example of an introductory survey starting students off on an elementary mathematics course (Studiengemeinschaft Werner Kamprath)

Exercises, to which the solutions of the problems set are attached for self-correction, and also test questions, problems to be solved by the student and checked by the instructor and other tests are most suitable as incentives to limited repetitions. By careful construction of exercises and tests most valuable repetitive surveys of the principal facts in a course can be brought about. Examples will be given in the discussion of exercises and tests below.

Some schools have favourable experiences of introductory surveys providing brief basic information about the subject to be studied in the following unit. Thus Studiengemeinschaft Werner Kamprath Darmstadt K G send their students "leaders" (*Vorspann*) in the form of a skeleton sketch (*Inform-Skelett*) of what is to follow. See illustration 4.

Questions, Exercises, Diagnostic and Prognostic Tests

Naturally all the training a student gets in discussing and solving problems relevant to his studies can be dealt with under the heading "Exercises". However, in this context it is practical to make a terminological distinction between on one hand such tasks as require work to be sent to the instructor for correction and comment and on the other hand other kinds of exercises. As the former have, to some extent at least, the character of tests, they will, for convenience sake, be called

tests, *test questions* or *test problems*. Thus the term *exercise* is reserved for types of tasks and problems, to which no answers, reports, or solutions are to be submitted. A simple separate variety of these is constituted by ordinary questions concerning facts.

Exercises and tests form part of the didactic conversation which may characterize a correspondence course. It is possible by means of suitable questions, exercises and tests not only to check knowledge but also to provide actual teaching. Of course, this is nothing new but simply an attempt to apply the old method known as Socrates' *maieutics*, i.e. midwifery. Socrates put his questions in such a way that he made his listeners produce their foetuses of thought, that is he made them bring out into clear consciousness conceptions previously latent in their minds and made them draw the proper conclusions. It is worth stressing that Socrates himself did not draw the conclusions. He made his listeners see the solution on their own. Something of the same kind can be brought about by suitable questions, exercises, and tests in a correspondence course.

Repetitive Questions

In many cases a student needs help both to learn the necessary facts and to practise his newly acquired knowledge. To satisfy the first of these demands several correspondence schools have found it useful to provide their students with a series of detailed questions on each lesson intended to make it possible for them to check that they retain all important facts. In most cases no answers to these questions are given, the idea being that the student, when in doubt about a question, should carefully re-read the relevant section of the lesson and then tackle the question again. The Dutch Leidsche Onderwijsinstellingen has a system of numbering small sections of the lessons and then referring to the numbers in the questions. See illustration 5. Some schools reject this system as they fear that it does not guarantee a sufficiently solid knowledge to be able to answer the questions. On the other hand questions with full answers given on a following page occur in some courses. Sometimes answers to questions of this type on a lesson already studied are included in a later study unit.

A kind of "programmed repetition" is reported to be useful in some contexts. A leaf containing questions with replies recommended for self-check repetition in a kind of simple teaching-machine is shown in illustration 6.

Wél is er in Nederland gebrek aan recreatieruimte, vrije natuur en landbouwgrond. In die zin zou men Nederland overbevolkt kunnen noemen. ❽

Dichtheid niet overal gelijk

De dichtheid van bevolking in Nederland is lang niet overal even groot. Op kaart 8 van de Bosatlas kunt u een overzicht krijgen van de bevolkingsdichtheid in de verschillende delen.

Drente en de Veluwe zijn dun bevolkt, terwijl vooral de beide Hollanden een grote bevolkingsdichtheid hebben. ❾

De ene streek heeft een vestigingsoverschot, de andere een overschot wat betreft het vertrek.

Delen van Nederland die een *vestigingsoverschot* hebben, zijn: ❿

de grote steden;
de industriegebieden;
de zandgronden.

Delen die een *vertrekoverschot* boeken, zijn: ⓫

de laagveengebieden;
de zeekleigebieden.

Veen- en zeeklei-gebieden stoten mensen af

Dat veengebieden en zeekleigebieden afstotend werken, kan men als volgt verklaren: op de *zeeklei* kunnen de boeren zich een behoorlijk bestaan verwerven, als de te bewerken grond niet te klein is. Heeft een boer echter verscheidene zonen en zou hij de grond gaan versnipperen, dan zal geen van de zonen zich een behoorlijk bestaan kunnen verschaffen. Men doet dus het ⓬

---

❽ In welk opzicht is Nederland in ieder geval overbevolkt?
❾ Welke delen van Nederland hebben een geringe bevolkingsdichtheid?
❿ Noem delen met een vestigingsoverschot.
⓫ Idem met een vertrekoverschot.
⓬ Waarom werken zeekleigebieden afstotend?
⓭ Wat verstaat men onder landhonger?
⓮ Waarom werken de laagveengebieden afstotend?
⓯ Verklaar, dat de grote steden mensen aantrekken.
⓰ Waarom gaan de mensen graag naar industriegebieden?
⓱ Hoe staat het met aantrekking of afstoting op zandgronden?
Wat zijn forensen? Noem forensenplaatsen.
⓲ Waardoor en wanneer is er nogal schommeling in het Nederlandse geboortecijfer opgetreden?

Illustration 5. Self-check questions connected by means of figures in the margin with the actual text of the teaching unit quoted from page 10 and 2 respectively of a Dutch course (Leidsche Onderwijsinstellingen)

PR	Elektrische Anlagen und Netze	Leitungen und Netze	Schablone 1	EAN 1	Blatt 2
0	Bei Energiekabeln unterscheidet man _____-leiter (Abb. a) und _____leiter (Abb. b).	Abb. a. _____ Abb. b. _____		Abb. a. Rundleiter Abb. b. Sektorleiter	
1	Ordnen Sie die nebenstehenden Buchstaben so, daß die technischen Kurzzeichen für Gummikabel, Kunststoffkabel, Gummibleikabel und Papierbleikabel gebildet werden:	G, G, G, K, K, N, N, N, N, Y, Y a. Gummikabel _____ b. Kunststoffkabel _____ c. Gummibleikabel _____ d. Papierbleikabel _____		a. Gummikabel NGG b. Kunststoffkabel NYY c. Gummibleikabel NGK d. Papierbleikabel NK	
2	Unter welcher Sammelbezeichnung werden Luftkabel, Bergwerkskabel, Fluß- und Seekabel, Schiffskabel u. a. m. zusammengefaßt?			Sonderkabel	
3	a. Was dient zum sicheren Abschluß der Kabelenden? b. Wie heißen die Verbindungsglieder einzelner Kabellängen? c. Welche gemeinsame Bezeichnung gilt für beide?	a. Kabel _____ b. Kabel _____ c. Kabel _____		a. Kabelendverschlüsse b. Kabelmuffen c. Kabelgarnituren	
4	a. Wie erfolgt die Energieversorgung dichtbesiedelter Gebiete? b. Wie erfolgt die Übertragung der Energie über größere Entfernungen?			a. durch Kabel b. durch Freileitungen	

5	Wie heißt die Formel für den Leistungsverlust einer Drehstromleitung, wenn die Verbraucherleistung N, die verkettete Betriebsspannung U_V, der Phasenwiderstand R und $\cos\varphi$ bekannt sind?	$N_V =$ _____	$N_V = N^2 \cdot \frac{R}{U_V^2 \cdot \cos^2\varphi}$ Diese Formel sollten Sie sich merken!
6	Man kann also aus der nebenstehenden Formel ersehen, daß der Leistungsverlust bei unveränderter Verbraucherleistung durch die Erhöhung der Übertragungsspannung ____ wird.	$N_V = \frac{R}{U_V^2 \cdot}$ Vervollständigen Sie die Formel!	Hoffentlich haben Sie die Formel nicht vom vorangegangenen WS abgeschrieben. herabgesetzt
7	Um die innere Betriebssicherheit bei der Energieversorgung über eine Drehstromleitung zu gewährleisten, sind die folgenden Werte einzuhalten: $N_V = 100$ kW; $U_V = 10$ kV; $R = 1\Omega$; $\cos\varphi = 1$. Wie groß sind die Leistungsverluste?	$N_V =$ _____ $N_V =$ _____ W = _____	$N_V = 100$ W Wenn Ihr Ergebnis stimmt, gehen Sie weiter zu WS 2.9, wenn nicht, gehen Sie zu WS 2.8 über!
8	Sie müssen sich die nebenstehende Formel gut einprägen; denn die gegebenen Werte müssen Sie in diese Formel einsetzen. Versuchen Sie es noch einmal! $N_V = 100$ kW; $U_V = 10$ kV; $R = 1\Omega$; $\cos\varphi = 1$.	$N_V = N^2 \cdot \frac{R}{U_V^2 \cdot \cos^2\varphi}$ $N_V =$ _____ W = _____ W	$N_V = 100$ W Wenn Ihr Ergebnis stimmt, gehen Sie zu WS 2.9 über. Sollten Sie nicht zu dem Ergebnis gekommen sein, lesen Sie Abschnitt I. 1. auf dem Ergänzungsblatt.
9	Es sind folgende Daten einer Drehstromleitung bekannt: $N = 100$ kW; $R = 10\Omega$; $\cos\varphi = 1$; $N_V = 10$ W. Wie groß ist die verkettete Betriebsspannung?	$N_V =$ _____ $U_V^2 =$ _____ $U_V^2 =$ _____ $(kV)^2 =$ _____ $(kV)^2$ $U_V = U_V^2\ (kV)^2 =$ _____ kV	$U_V = 100$ kV Wenn Ihr Ergebnis nicht stimmt, lesen Sie Abschnitt I. 1. auf dem Ergänzungsblatt.

Illustration 6. A series of repetitive questions of a self-check type intended for use in a teaching-machine or with the help of a mask covering column 3 of each item at the same time as it reveals columns 1 and 2 (Studiengemeinschaft Werner Kamprath)

Exercises

As soon as skill at solving problems and applying knowledge acquired becomes essential, as in mathematics, physics, chemistry, technical subjects, languages, accountancy etc., it is of great value to the student to get an appropriate amount of practice. It is not enough that he can follow a theoretical discussion leading to the correct conclusions; he must be able independently to produce solutions of problems similar to those discussed in the lesson. Much practice is needed in some subjects (such as mathematical subjects, foreign languages and accountancy), and as a preparation for the test problems which are to be sent to the school it has proved practical to include in the various lessons a series of self-check problems. Thus a considerable amount of active work on the part of the student can be brought about to stabilize his knowledge and his practical skills. In some cases printed or duplicated forms where the students fill in gaps, solve problems, answer self-check questions etc. can contain the exercises, and specially prepared exercise-books of this type are in use (illustrations 7 and 8).

Model answers and complete solutions to problems given in this way are provided in the course, either in the lesson containing the exercises or in the following lesson. It has proved useful to supplement some of these model answers or solutions with comments explaining, with reference to the lessons, why the solution given is the correct one, how it has been reached and what possible alternatives there are. Every educator should remind himself from time to time that the average student cannot be expected to see, without assistance, all the logical contexts his teacher may wish — or, judging from what has been taught, expect — him to see, and course editors must be on their guard against regarding the correct answers to questions or the proper solutions of problems as self-evident. It is not sufficient to cater for the best students only. Comments of the type mentioned in connection with exercises are more often required than actually met with. A discussion based on the solution of even simple problems is very often valuable in considerably improving the students' capacity to benefit from the course.

What is called diagnostic tests below can also be arranged in the form of exercises.

Diagnostic Tests

In the interest of effectiveness it is essential that both the correspondence school and the student himself should realize what the student's

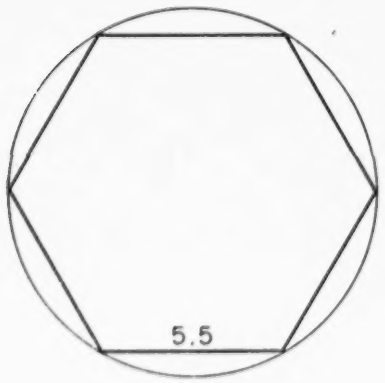
Learning More about Linear Measure

Regular Hexagons

Sample Problem 2a

Find the circumference of the circumscribed circle for a regular hexagon whose sides are 5. 5 inches long.

Draw a regular hexagon and its circumscribed circle, mark the given dimension on the drawing, and use the formula $C = 2\pi s$.



Instruction	Operations
Step 1. Write the formula in this form.	1. $C = 2 \times \pi \times s$
Step 2. Write the given values.	2. $\pi = 3.14$, $s = 5.5$
Step 3. Substitute these values in the formula. Multiply.	3. $C = 2 \times 3.14 \times 5.5$ $C = 34.54$

The circumference of the circumscribed circle is 34. 54 in.

Self Test 2A

After finding the circumferences of the circumscribed circles for these regular hexagons, check your answers with the Answer Key.

PROBLEMS	SHOW WORK HERE
a. $s = 4$ ft., $C =$?	a.
Answer:	
b. $s = 12$ ft., $C =$?	b.
Answer:	
c. $s = 7.25$ in., $C =$?	c.
Answer:	

Illustrations 7 and 8. Self test questions to be answered either on a pre-printed form or on the pages of the lesson units occur frequently. Page 43 shows an example taken from a mathematics course published by the American School and page 44 one from a Swedish course in English (HERMODS-NKI)

3 What adjectives correspond with 1 pride ..... 2 length ..... 3 madness ..... 4 person ..... 5 fool .....

4 Try to use *one word* instead of each of these phrases:
1 say yes to a suggestion ..... 2 make up one's mind ..... 3 be fond of .....

5 Put *do* or *make* into the spaces:
Aren't you going to 1 ..... anything about it? That will 2 ..... us all very happy. Let me 3 ..... the packing. Your words 4 ..... me laugh. Will you 5 ..... me a favour? That won't 6 ..... any difference. You must 7 ..... friends with your enemies. We must 8 ..... without your help. Will this 9 ..... ? Four times five 10 ..... twenty. If you don't 11 ..... it voluntarily, I'll 12 ..... you 13 ..... it.

6 Change the following sentences into questions:
He went on the stage.

.....

You did most of the work.

.....

.....

She wants you to buy her a big box of chocolates.

.....

.....

7 Write about 100 words under the title:
I packed for a journey to England. (Mention for instance what you packed, how you packed, what happened while you were packing etc.)

.....

.....

.....

.....

.....

Illustration 8. Cf. text at the bottom of p. 43

standard is and where his difficulties lie. This is, of course, the starting-point for measures taken to help him. Correspondence educators traditionally work with questions and problems of both a self-check and a test character for this purpose. I am afraid we must confess, however, that it is not too difficult anywhere in the world to find questions, exercises and tests in correspondence courses that have evidently been created more as a matter of routine than as a result of a close study of what is actually required from a diagnostic point of view. Probably we have normally been a little more successful in meeting another essential demand, namely that concerned with providing questions, exercises and tests that stimulate further study and are likely to create intellectual inquisitiveness.

Under the influence of the demands raised by the work of their school within the official school system the teaching staff of HERMODS-NKI have become increasingly aware of the importance of introducing well tried-out *diagnostic tests*, to which batteries of special instruction sheets belong. When a student shows in a diagnostic test (in a couple of courses there are two of these per study unit of 16—48 pages) that there is something he has not grasped or something he needs more practice in, then he can immediately be referred to the instruction sheet that deals with his particular difficulty and nothing else. This favours, for obvious reasons, the student's motivation much more than a reference to what he has already studied (though with unsatisfactory results). Examples of a diagnostic test with the corresponding instruction sheet are shown in illustrations 9 and 10.

In normal correspondence teaching, where no classroom teacher is available, the student can check his own diagnostic tests and, following the directions in these, select the instruction sheets he needs. These instruction-sheets can sometimes profitably be written in the form of instruction programmes in Skinner's or Crowder's manner.

Prognostic Tests

As a rule each lesson ends with questions to be answered, problems to be solved and other tasks, such as writing an essay on a specified subject or a report on practical work (for instance of a laboratory type). These tests also to some extent have a diagnostic character but are largely prognostic. They serve the purpose both of providing the student with personal tutoring and of showing his tutor and the school what progress he is making. For these reasons it is important that all

Diagnostiskt prov 76 B Används när eleven läst hela brev 6

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1 Lös följande ekvationer genom "huvudräkning".

SVAR

$x \cdot 6 = 18$ $x =$ ☐

$6 \cdot y = 42$ $y =$ ☐

$9 \cdot a = 81$ $a =$ ☐

2 Lös följande ekvationer genom att dividera båda leden med lämpliga tal.

SVAR

$5 \cdot x = 22$ $x =$ ☐

$y \cdot 6{,}4 = 73{,}6$ $y =$ ☐

$z \cdot 10{,}1 = 131{,}3$ $z =$ ☐

3 Lös följande ekvationer genom att först omvandla egentligt bråk till decimaltal.

SVAR

$\frac{7 \cdot x}{10} = 63$ $x =$ ☐

$\frac{9 \cdot p}{50} = 3{,}6$ $p =$ ☐

$\frac{3 \cdot n}{4} = 13{,}5$ $n =$ ☐

4 Lös följande ekvationer genom multiplikation och division med lämpliga tal.

SVAR

$\frac{3 \cdot x}{7} = 6$ $x =$ ☐

$\frac{x \cdot 6}{11} = 21$ $x =$ ☐

$\frac{4 \cdot y}{9} = 1{,}6$ $y =$ ☐

Ekvationer, som löses genom division, sedan man först omvandlat ett allmänt bråk till decimaltal

I brev 2 har du fått lära dig, hur man kan omvandla vissa allmänna bråk till exakta decimaltal. Så är t ex $\frac{2}{5}=0{,}4$, $\frac{9}{4}=2{,}25$, $\frac{7}{20}=0{,}35$ och $\frac{3}{25}=0{,}12$.

Detta kan du använda dig av, när du ska lösa ekvationer av en viss typ, nämligen sådana ekvationer, där det obekanta talet förekommer som faktor tillsammans med ett allmänt bråk av ovannämnda slag.

I ekvationen $\frac{7\cdot y}{50}=56$ kan vänstra ledet också skrivas $\frac{7}{50}\cdot y$ och alltså betraktas som en produkt mellan faktorn $\frac{7}{50}$ och faktorn y. Bråket $\frac{7}{50}$ kan skrivas som decimaltal och blir då 0,14. Ekvationen får då detta utseende: $0{,}14\cdot y=56$. Denna ekvation löses nu genom division på detta sätt:

$$\frac{\overset{1}{\cancel{0{,}14}}\cdot y}{\underset{1}{\cancel{0{,}14}}}=\frac{56}{0{,}14}=400$$

Svar: $y=400$

Ytterligare exempel:

$\frac{9\cdot x}{20}=72$; $\quad 0{,}45\cdot x=72$; $\quad \frac{\overset{1}{\cancel{0{,}45}}\cdot x}{\underset{1}{\cancel{0{,}45}}}=\frac{72}{0{,}45}=160$

Svar: $x=160$

$\frac{7\cdot b}{4}=630$; $\quad 1{,}75\cdot b=630$; $\quad \frac{\overset{1}{\cancel{1{,}75}}\cdot b}{\underset{1}{\cancel{1{,}75}}}=\frac{630}{1{,}75}=360$

Svar: $b=360$

76 B:3

Illustrations 9 and 10. Example of a diagnostic test (page 46) and of an instruction sheet (above). The extract from the instruction sheet contains the beginning of the explanation of item 3 of the diagnostic test (HERMODS-NKI)

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essential parts of a lesson or a series of lessons are covered in the tests. Test questions, problems and essay subjects must not be chosen at random but should be carefully selected out of the variety of possible tasks in such a way that the student is led on in his work in the most efficient manner. If the answers of test questions can be taken more or less *verbatim* from the text of the course, they must be considered

failures as they neither lead the student on, nor induce him to consider the question on his own from other starting-points than those of the lesson he has just read.

It is important that authors and course editors do not waste either

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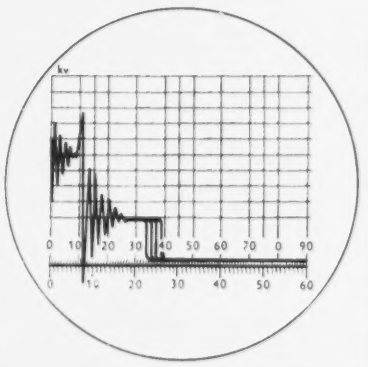
EJERCICIOS GENERALES

9. — Si en la pantalla de un osciloscopio como el presentado en la lección, apareciera una imagen semejante a ésta, ¿qué síntoma diría Vd. que tiene el motor?



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.....

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10. — Enumere Vd. las causas por las cuales puede producirse una avería en un automóvil.

.....

.....

.....

11. — Vd. ha estudiado en esta lección que el compresómetro marca sobre el dial del reloj la presión en kgs/cm^2. Sin embargo los indicadores de diagramas actuan de otra manera y muestran las presiones alcanzadas de otro modo. Indique Vd. a continuación cómo se indican las presiones en los indicadores de diagramas.

.....

12. — ¿Por qué razón es aconsejable que el amperimetro posea una escala de cero central?

.....

13. — Indique Vd. cómo se efectuan las conexiones de la lámpara estroboscópica.

.....

.....

Illustration 11. Test questions, the answers of which are to be submitted for correction and comment (CEAC, Barcelona)

the student's time or the instructor's by setting tasks which necessitate an unnecessary amount of work in proportion to the instruction value. Long essays on matters of pure fact are hardly suitable; often it has proved useful simply to ask for a full plan of an essay plus certain detailed answers instead of a complete essay. This is enough if the important thing is to make the student re-arrange his knowledge in order to survey something from a new angle and thus improve both his memory of facts and his insight into the conditions or problems involved. In subjects teaching skills (like mathematics, accountancy, engineering subjects and languages) prepared assignment forms are useful and can serve the purpose of suggesting the reasonable length of the student's written work. An example of this type of tests given at the end of correspondence lessons is given in illustration 11.

Especially in the U.S.A. it has been found practical to use so-called objective tests, which only require of the student a marking in the right place. Their advantage is that they can be judged wholly objectively (it is even perfectly possible to have the marking done by means of an electronic data processing machine), whereas an essay-test must be marked in accordance with the instructor's necessarily to some extent subjective judgment. The chief types of objective tests which have been used in correspondence courses are:

1 *Multiple-choice tests.* The student marks which of several alternative answers is the correct one.

2 *True-false tests.* The student only has to put a mark under the heading, 'yes' ('right') or 'no' ('wrong').

3 *Matching tests.* The student has to connect items in one enumeration with the correct ones in another.

4 *Re-arrangement tests.* The student numbers with figures words or phrases denoting the various items of a series of events, a process of work etc. to demonstrate the right order between the items.

5 *Completion tests.* The student fills in gaps in sentences requiring figures, terms, or other indications of fact, missing endings in a sentence in a foreign language etc.

Further information about objective tests are found in standard handbooks.

Tests of this kind (with the exception of type 2 which encourages

mere guessing) are sometimes useful to check factual knowledge. They may also serve instructional purposes if after the test the student receives model solutions with comments. Naturally the value of objective tests is strictly limited, as they do not induce the student independently to *express* his insight into logical connections etc. Normally it

LESSON 4

School Practice Examination

FSEE

INSTRUCTIONS:

In the following questions select from among the words supplied, the one word which you believe best completes the sentence. Indicate on your grey School Examination Answer Sheet the letter which identifies the proper word.

1. *Gun* is to *shoot* as *razor* is to .....
   A) shave D) hit
   B) cut E) blade
   C) fire

2. *Hat* is to *shoe* as *head* is to .....
   A) toe D) foot
   B) feet E) moccasin
   C) ankle

3. *Fly* is to *bird* as *run* is to .....
   A) antelope D) whale
   B) duck E) turtle
   C) fish

4. *Wet* is to *dry* as *clean* is to .....
   A) damp D) frigid
   B) ugly E) pure
   C) dirty

5. *Plumber* is to *wrench* as *butcher* is to .....
   A) baker D) abbatoir
   B) bread E) knife
   C) pipe

INSTRUCTIONS:

In the following questions, select from the answers furnished the correct number to follow the series. Mark the identifying letter on your grey Answer Sheet.

6. 3; 13; 4; 15; 5; 17; 6; 19; 7; ?
   A) 8 D) 21
   B) 15 E) None of these
   C) 20

7. 4; 5; 7; 10; 14; 19; ?
   A) 20 D) 24
   B) 21 E) 25
   C) 23

8. 20; 15; 11; 8; 6; ?
   A) 4 D) 1
   B) 3 E) None of these
   C) 2

9. 5; 7; 9; 12; 15; 19; ?
   A) 22 D) 25
   B) 23 E) 26
   C) 24

10. 9; 10; 12; 15; 19; 24; ?
    A) 25 D) 28
    B) 26 E) None of these
    C) 27

is required that a student should be able to express himself verbally, and this is where the objective tests are not appropriate. For that reason they can play only a limited part in correspondence education. However, they are entirely appropriate in the cases when an analysis of the desired result of a training programme shows that recognition (and not

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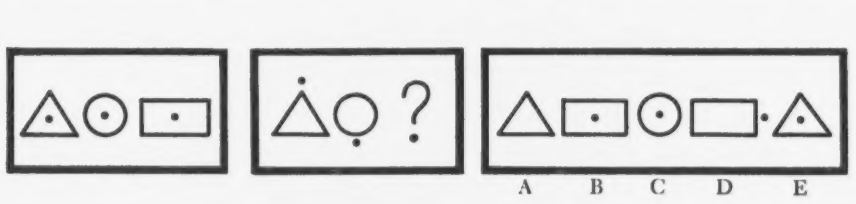
INSTRUCTIONS:

In the following questions, select from the figures in the box at the right the appropriate figure to replace the question mark in the center box. Mark the identifying letter on your Answer Sheet.

11.



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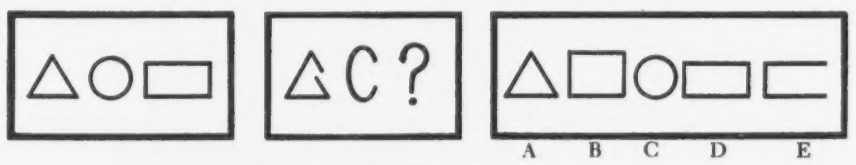
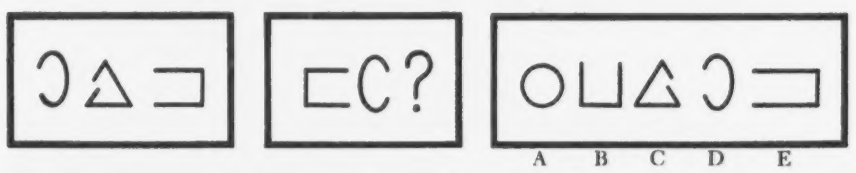
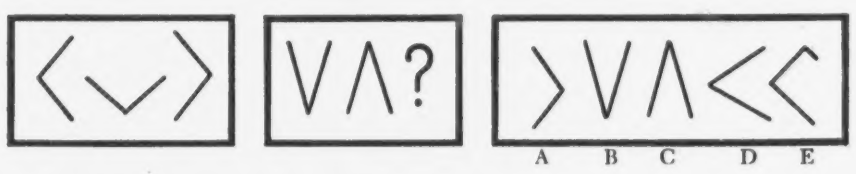


13.



14.



15.

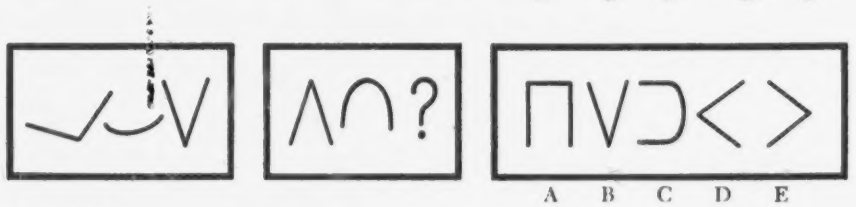


Illustration 12. An example of a test paper included in an American course intended for students preparing to take an IBM-scored government examination (Key Training Service)

the ability to record something) is essential as, for instance, in teaching a worker how to act in response to a certain signal from a machine.

Illustration 12 shows a test paper consisting exclusively of "objective" questions. It is part of an American course for students preparing to take a government examination which is entirely IBM scored.

Further Remarks on Exercises and Tests

The construction of suitable questions and problems is a complicated procedure, particularly as they serve several purposes. These include

a the end-of-course examination problems, the contents of which should faithfully reflect the course aims decided on and guide the whole writing of the course

b the factual questions serving as reminders of what facts must be memorized

c the diagnostic tests governing the use of supplementary teaching facilities (see above on so-called instruction sheets)

d skill-supporting exercises training the practice of knowledge acquired by means of appropriate problems

e exercises leading the student on in his further work (cf. what has been said on Socratic *maieutics* above)

f tests serving the purpose of judging the students' level of knowledge and skills.

Even if it is possible to unite more than one of the purposes referred to in one problem or question, it is always advisable to decide on the main purpose before it is included in a course. If due respect is paid to students' valuable time I am afraid not a few questions and problems must be weeded out from authors' and course editors' drafts (as well as from existing courses). It is also important that test questions should be limited to the number and types required from entirely rational view-points so that students are not caused to work on too many just because course producers like a uniform number of them at the end of each unit.

Some of my opinions on what good and useful exercises and tests are like have been recorded above. I finally wish to refer my readers to Graff's interesting paper on the subject in the CEC Yearbook 1965 and quote a passage from him:

"The adult — with a few exceptions in academic courses — is not inclined to mere book-learning. Give him exercises where he can (or is forced to) apply the knowledge he has gained in the lessons; *real* problems in *real* situations, provoking *actual* behaviour — not mere discussions on a high-brow level.

Examples:

— In courses on cost control, students should be asked to solve "cases" which have actually arisen in business enterprises. Don't ask the student "What is the difference between direct and indirect factory costs?" two pages after he has been told the difference in a lesson. Instead, give him a *case* by which he can make clear which types of costs belong to the former, which to the latter.

— In engineering courses one too often finds exercises of the repetitive type which could easily have been changed into creative attacks on a problem by asking the student to choose the right material and appropriate dimensions for a geartooth, shaft, etc.

— An American correspondence school, specialising in the field of management courses, regularly sends "case studies" to its students, either for self-checking or as tests according to the definitions used in this lecture. One of them reads as follows:

"The work groups (3) in the processing department have turned in a below-par production record. The manager has threatened dismissal of key workers, but work groups continue to keep their records identical each day. Interviews have not been successful. Your manager has dropped this problem into your lap."[1]

The Instructor at Work

From what has been said above it is evident that the quality and value of correspondence teaching largely depends on the correspondence course. Clearly this does not mean, however, that there are only insignificant tasks left to the instructor who reads, corrects and comments on the written work which the student sends to his school. The two-way communication that is the backbone of correspondence education is the instructor's responsibility.

In some subjects the actual corrections are fairly easy to make, but

1 Op. cit. pp. 58—59.

no teacher can confine his activity to correcting. The student must be made to understand what is wrong or doubtful in his paper and why it must be changed in the way the instructor has corrected it. Sometimes the explanation can be made simply in the form of a reference to a lesson, for instance when a factual mistake has been made, but often an explanation along logical lines must be given. It is necessary that the instructor should know both his subject and the course in question well, that he has acquired the capacity quickly to see through various mistakes so that he can elucidate the points which form the background of the misunderstanding, and that he can write lucidly and succinctly. The author of this paper has often been struck by the valuable technique developed by some correspondence instructors in this field.

In some subjects and at some stages certain types of mistakes are so common that at least one European school has found it practical to print special so-called correction cards, in which the difficulties concerned are explained. Particularly in language teaching it is often worth while referring the student to such cards, in which for instance points of word order, tenses, and the use of articles are fairly fully dealt with. It is considered important that such cards should be sent to the student only in cases when they are entirely to the point. The instructor naturally has to make a reference to the card when correcting.

A difficulty most correspondence instructors come across is the question what to do when a student only answers that he does not know or does not understand how the problem in question ought to be solved. It occurs particularly in mathematics and kindred subjects that the student asks for a complete solution without submitting any work of his own. There seems to be general agreement that in such cases the instructors should tell the student to try to start working on the problem and to send in his attempt so that his personal difficulties with the problem may be counteracted by the instructor's explanations. As a rule some suggestions or references to a lesson can be made to start the student off. The idea behind this is that the student, to learn something, must do the work actively himself and that it is the instructor's task to teach and not to deliver ready-made solutions of problems.

For reasons stated above it is preferable that all explanations should be based on the student's paper, which the instructor often has both to correct and complete, but sometimes this would mean too considerable an amount of writing for him. Thus, when he judges it advisable he corrects and explains only the actual mistake and then refers the

student for the rest of the solution to a duplicated or printed sheet.[1] In some schools (typical examples: HERMODS-NKI, Leidsche Onderwijsinstellingen) such sheets are used extremely restrictively, but particularly in France it occurs that as a matter of routine a so-called *corrigé-type* or *corrigé-modèle* is sent to the student together with his corrected solutions.[2]

Some schools, when they send a new lesson to the student, provide model answers to test questions given in the preceding lesson. If, as is sometimes the case, new lessons are sent out at fixed intervals irrespective of the work produced by the individual students, it may be possible for a student to work at the tests with the model answers in front of him. This procedure seems to me to encourage self-deception in the normal, less strong-minded type of student.

A valuable means of helping the students that seems to be used too little, is to produce a series of extra instruction sheets (see above p. 45) inclusive of tests which can be sent to students who, when solving the ordinary tests of a course, prove to have difficulties with certain aspects of a subject.

Detailed written instructions on how to correct and comment on students' work have been issued by some schools. Most easily available are some short rules agreed on by a study group at the international conference on correspondence education at the University of Nebraska in 1948 and published in the ICCE Proceedings 1948 (pp. 52—54) under the title "Methods and Techniques of Instruction".

1 Cf. on correction cards, references, and model answers the report of the International Conference on Correspondence Education in 1957 (Proceedings 1957 p. 169).

2 This is the case in L'École Universelle, Paris, and L'École des Sciences et Arts. I am not convinced that this is a valuable procedure. Evidently it is considered a good working-method by the schools mentioned. M. F. Ozil, the late Director General of the former, wrote in 1958: "J'estime que le corrigé type, devoir entièrement traité ou plan détaillé et raisonné établi par le professeur, complète la correction minutieuse et détaillée de la copie: c'est pour l'élève l'exemple joint au précepte" (in a letter to the author). The study group on instruction methods at the international conference on correspondence education at the University of Nebraska in 1948 accepted the same method in language and drafting courses and pointed out that it reduced the instructor's time in correction (Proceedings 1948 p. 54). The question is whether this advantage is important enough to allow us to renounce our insistence on individual comments. Personally I can accept the model answer only as an exceptional and subsidiary means.

KEY TRAINING SERVICE

HOME TUTOR

DATE_____

NAME_____
(PLEASE PRINT)

STUDENT NO. ➧

ADDRESS_____

CITY_____ STATE_____ ZIP NO._____

I am having difficulty understanding the subject(s):

_____

_____

It is covered in Lesson(s)_____; on page(s)_____

My problem or question* is:

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

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_____

_____

_____

_____

_____

_____

_____

*If you are referring to a specific instructional example, or Review Exercise, Home Study Quiz or School Practice Examination item – give the exam item number or the paragraph number, with specific Lesson and page number. *(continue on back if necessary)*

FREE

Illustration 13. The distribution of sheets of this type encourages students to ask relevant questions (Key Training Service)

Some students tend to be reluctant to ask questions even when they are aware that they need extra help. It is an essential task for the instructor to encourage and answer such questions. A form designed to attract the shy student to indicate his questions or problems is shown in illustration 13.

Advising Students

That it is vitally important that every student should be enrolled for the right course or group of courses is self-evident. Correspondence schools contribute to the right choice in various ways.

First the practicability of pursuing the plans leading to the studies a prospective student prefers must be made clear. This is normally done by providing him or her with fairly full information about the requirements for the career in question (such as practical experience in the field, age and, if possible, chances of employment). Such information can, after the prospective student has decided on the career, be supplemented with advice what type of job he or she should try to get in order to combine study and practice in a profitable way. This type of advising requires a group of specialists to be engaged by the school and may offer considerable difficulty. It is extremely important, however, and can be solved by close co-operation with the organizations of the labour market, professional training institutions, universities etc. Under no circumstances is this type of advising to be neglected. A lack of it may lead to personal tragedies, as when a person finds after years of hard study that his theoretical knowledge is of no avail because he has not based his studies on the practical experience required, is too old to enter the career or is disqualified on account of formal conditions. Complete information before a student enrols is a *sine qua non*, and so are successive informative letters during the study if conditions change in a way to be of importance to the student.

Second, after a student has decided on a career he should be advised to choose the course that suits his standard of knowledge and skills as well as possible. In my experience this, in the cases when large career courses are concerned, necessitates a thorough study of the certificates showing what studies the prospective student has already completed and with what success he has passed formal examinations or acquired certain recognized competence. It is important for the individual that

his course is as short as possible and that no unnecessary study units are included, so that it does not take more time than necessary. On the other hand it is equally important that it encompasses all the necessary subjects and part-courses so that he does not get into difficulty because his pre-knowledge is too poor to make him capable of benefiting from certain complicated parts of the course. Diagnostic tests may be helpful here. Aptitude tests have been used in Sweden, but so far the results have not been very encouraging.

Third, while students work with their courses most of them are in great need of moral support in the form of letters informing them about interesting developments in their field and of reminders of the periods for any formal examinations etc. In this way they are made to feel that they have the support of their school also apart from the teacher-comments on their written work. Correspondence schools constantly have to follow students' progress and remind and encourage those who show tendencies to fall behind.

However, there are different opinions about the extent to which correspondence schools should write of their own accord to encourage such students as fall behind their plan of study. Some schools find that too extensive work of this kind implies favouring the less efficient students at the cost of the really good ones. The experience of other schools is that reminding letters improve the average results considerably and are of the greatest importance to make students complete their courses. Procedures vary in this respect. Personally I am wholeheartedly in favour of a systematic continual scrutiny of students' records with a view to distributing reminding letters of different types. It is essential to prevent students as far as possible from failing to complete their studies or generally to benefit fully from their correspondence course.

Students are often in need of advice concerning further studies, professional requirements and other matters more or less closely connected with their school work. It is felt by many correspondence schools that giving such advice is an important subsidiary task if the school and the tutors are to take the place of ordinary 'oral' schools and their teachers.

In most cases a correspondence school must organize a special department to deal with the requests of students and prospective students for information and advice. I wish to emphasize the importance of such work, which must naturally be done competently,

thoroughly, and amiably. It is, apart from the written contact with the tutors, one of the best means by which a feeling of personal contact between student and school can arise. Experience shows that co-operation based on confidence in the school and its representatives promotes good results. In fact, a research report supporting this point has been published.[1]

The procedures for properly informing and advising students and prospective students should actually be regarded as important instruments for the educational method of correspondence instruction.

Supervised Correspondence Study

I have already mentioned that there is in some parts of the world (notably Australia, New Zealand, certain states in North America, Sweden and now gradually beginning in the United Kingdom) a systematic use of correspondence courses in the official school systems. The children work under the supervision of teachers (or, in some cases where small children are concerned their mothers). An interesting report of this activity is given in Rayner's book to which I have referred above. The subject has further been dealt with by Mitchel, whose book on supervised correspondence study was published as early as 1939. A fairly full treatment of the subject is found in The Bulletin of the National Association of Secondary-School Principals, December 1952, (Childs and others). Cf. also Kempfer p. 268 and Proceedings 1953 pp. 89—105. The applications of this teaching method in Sweden, about which very little has been written in other languages than Swedish,[2] will be given some prominence in the discussion below.

1 Montross.

2 Holmberg, Tuition by Correspondence in Swedish Schools (1959); How Can Correspondence Instruction Be Utilized in an Overburdened Formal School Situation (ICCE Proceedings 1965). See further the official Swedish pamphlets Glesbygdernas skolfrågor and Undantagsformer av allmänbildande gymnasier (Kungl. Skolöverstyrelsen, Stockholm, 1957 and 1959). My exposition here agrees closely with that followed in my lecture at the CEC congress in 1964 (CEC Yearbook 1965).

The Impetus to Apply Supervised Correspondence Study in Schools

Why do schools go in for this type of study? In Sweden — and, I think, in most other countries — the background is:

a the shortage of academically qualified teachers;

b the small numbers of pupils in some districts, i.e. circumstances typical of sparsely inhabited and remote areas. However, the advantages of this method have been considered so great, particularly in facilitating individualization, that even many schools in thickly populated areas apply it for groups of pupils or groups of subjects.

Description of Method

Instead of being concerned with only the student and the correspondence school as in ordinary correspondence education we have now to consider the supervising teacher as well.

Pupils

What is above all typical of the class-room situation is that the greater part of each pupil's day at school is devoted to individual study of correspondence lessons. This means that in the class-room he reads his lessons, consults reference books, does his exercises, either in writing or, following the instructions of his correspondence course, by listening in a little booth to recordings or by recording his own pronunciation in foreign languages, and that he does his assignments which are to be sent to the correspondence school for correction. If in this individual work of his he feels uncertain, he consults the supervising teacher.

In addition to this individual work the pupils work in groups. While the individual work is done in the class-room, where the comparative silence of a library is observed, there are special group-rooms for this work. Normally the pupils then sit round a table. To some extent they co-operate spontaneously, but they also discuss their reading of literature etc. in organized groups, they experiment in the laboratory or listen to recordings, particularly in modern foreign languages. Finally they are — to some little extent — taught orally in the traditional way by the supervising teacher — normally a group of about

five pupils at a time in the group-room. The division of pupils into groups is based on what they have in common in their individual study. In some degree they read different things, depending on what choice of subjects they have made, and then, of course, they work at different speeds. The groups thus vary from period to period, from subject to subject.

Supervising Teachers

What then are the supervising teacher's tasks? His most important duty is to help his pupils in every conceivable way; he is his pupils' adviser. It is up to him to motivate them by giving inspiration and by keeping them aware of their goals. It is important to remember that the completion of each unit (lesson, letter or whatever we may call it) marks the reaching of one goal. Some pupils may find difficulty in following the exposition of the course: the teacher then explains it to them, either individually or in groups. Other pupils may feel uncertain what conclusions to draw from corrections when their assignments are returned from the correspondence school with the specialist-instructor's comments. Here again, the supervising teacher must provide the necessary explanations. It is also up to him to suggest further reading to pupils interested in a particular subject or part of a subject.

The supervising teacher has important administrative tasks. He must organize the work of his school or his form, which means that he must keep in close contact with the correspondence school. He must plan the local time-table; he has to plan the use of auxiliaries, such as tape-recorders, projectors, and demonstration materials; he makes the necessary arrangements for tests and he keeps his record of pupils' progress up to date.

Finally, the supervising teacher has to do some teaching of a more traditional kind. This is because there are things that cannot be taught entirely by correspondence, such as oral exercises in the mother tongue and in foreign languages. As pupils in the Swedish examination system are always expected to give an oral — as well as a written — account of their knowledge of and insight into what they have studied, the Swedish supervisor must give practice in discussing texts read and in reporting orally. The correct pronunciation of foreign languages is considered important and — although the use of tape-recorders for listening and practising is an effective means in this respect — most

pupils need help in the form of corrections and practical suggestions, so the supervising teacher has to join in the teaching of pronunciation.

Further, in foreign languages, he must drill speech patterns, e.g. by conversation exercises and by using so-called substitution tables, and he has to look after his pupils' laboratory work in subjects like biology, physics and chemistry.

It is evident from what I have said that the supervising teacher has very important tasks. His personal aptitude is more important than his academic knowledge as the course editors and specialist-instructors are easily available at the correspondence school where he can get in touch with them on the telephone if he wants to consult them. For the 13—16 year-olds in Sweden, elementary-school teachers with a good pronunciation in English and German have proved to be suitable, whereas university qualifications in the various subjects are necessary for the top stage. These top-stage schools (*gymnasier*) are invariably attached to schools that have a fairly big conventional lower stage (*grundskolehögstadium, realskola*), the specialist teachers of which do part-time supervising in the top-stage school.

The Correspondence School

The correspondence school produces courses and corrects the assignments of the pupils, but it must also plan the syllabus and set and mark the tests that are necessary in the school situation.

The correspondence school has to issue instructions to and train the supervising teachers, must advise pupils whose problems are referred to the school by the supervising teacher, keep local authorities and parents informed about the work and generally see to it that they work well and under favourable conditions. To do this the correspondence school must organize special administrative sections, and officers of the correspondence school must pay regular visits to the local school.

Finally, in those cases where school studies end in a formal examination, like the G. C. E. at advanced level (das Abitur, le baccalauréat, roughly corresponding to the stage reached at the end of the sophomore year of an American Liberal Arts College), it is up to the school to run oral refresher courses before the final written and oral examinations and, in the case of HERMODS-NKI which is both a correspondence school and an official examining board, to organize these examinations.

Characteristics and Problems

It will be evident that the type of school described favours the independence of the pupils and promotes their individual activity. People who do not work with schools applying supervised correspondence study sometimes doubt if the pupils receive a sufficient amount of oral training. If the school is run properly according to the instructions given, they do, and, judging by the examination results reached and speaking from my own experience, I do not hesitate to say that supervised correspondence study is without any doubt whatsoever a good and efficient educational method. This conclusion seems to agree perfectly with what has been reported from non-European countries.[1] When this is written (in 1967) interesting experiments along the same lines are being made in Great Britain by the National Extension College, Cambridge.

Supervised correspondence study has proved to be a successful solution of the school problems of sparsely inhabited parts of a country where there are few pupils and academically qualified teachers are not available in sufficient numbers.

In industry similar types of supervised correspondence study have in part been practised for the training of apprentices, foremen, clerks, and other staff. This is a form of study known also in Germany, where the supervisor is sometimes called *Studienberater*. Another application is found in so-called study circles run by adult education organizations like the W. E. A. and similar institutions.

Supplementary Oral Instruction

Oral instruction is widely applied as a supplement to correspondence education. This may be due to groundless fear that correspondence instruction could not be effective on its own — and this attitude doubtless appears often enough in some countries[2] — but is essentially a

1 Cf. Rayner, Childs and others referred to at the beginning of the chapter. See the evidence of 1965 provided by Bosson-Nordbö, Asahi, Davies, Figur and Tynan in the ICCE Proceedings 1965 pp. 58—64.

2 Cf. Graff, Autonomer Fernunterricht.

useful means of integrating various media for the benefit of the students and the efficiency of the instruction.

As has been shown above, there is no more reason to doubt that correspondence instruction is an autonomous form of teaching than to question the autonomous character of class-room teaching. Both these forms are considered to benefit from supplements such as TV-teaching, instruction in language laboratories and science laboratories, exploring excursions etc. and they can also profitably supplement each other.

Oral demonstration courses (or TV demonstrations) and laboratory courses are required in sciences and engineering. Equally important are conversation classes in foreign languages for which also either ordinary oral pronunciation exercises with a teacher or the same kind of teaching on tape recordings or by telephone are necessary.

Before oral examinations it is useful to get some practice in discussing orally the subjects studied. For this reason a need of short oral courses is often felt also as regards subjects of other kinds. This is particularly true about final examination studies in mathematics, Latin, and other theoretically difficult subjects as well as in subjects which require discussion, such as philosophy and literature.

A sclution which is being commonly practised is for the correspondence school or the individual student to use the services of other instructional institutions, such as evening schools. To avoid any kind of waste of time it is important, however, that all supplementary oral tuition should be wholly based on the teaching given in the correspondence courses. The most proper method from a purely pedagogical point of view is no doubt to organize such supplementary oral teaching in direct connection with the ordinary correspondence teaching of each school. This naturally happens in Australia and New Zealand, where correspondence education forms part of the official school system. As has been mentioned already, it is also done in Sweden by HERMODSNKI, which runs laboratory courses and oral refresher courses on its own premises for students reading for the General Certificate of Education examinations, the College of Commerce examination, and engineering examinations. As this tuition is concentrated in periods varying from four weeks (pure laboratory courses from one week) to four months it is possible for the majority of "ordinary" students, that is other students than those joining in so-called supervised correspondence study, to take part in them before an important examination. It is no doubt desirable that facilities of this kind should be made more

generally available. My experience is that a complete integration of this oral instruction with the correspondence teaching is most essential from the point of view of effectiveness and time-saving. For that reason it seems regrettable that many correspondence schools are not in a position to organize their own oral instruction.

The most highly developed form of supplementary oral instruction seems to take place in Eastern Germany, where not only refresher courses but also weekly or fortnightly consultation hours are arranged. This is no doubt a valuable procedure but is not comparable with conditions in the West, as the East Germans base this consultation service on the study of self-teaching courses[1] and not on actual correspondence instruction.

Sometimes it is difficult to make a clear distinction between the use of oral instruction as a supplement and supervised correspondence instruction as defined above. It is interesting to note that in Norwegian the term "combined instruction" (*kombinert undervisning*) is used for supervised correspondence instruction. There are evidently various ways of combining correspondence teaching and oral instruction.

Administrative Problems

The success of practically all the work discussed in the preceding chapters depends on the administrative procedures applied by the correspondence schools. It seems to be something of a tradition to make a distinction between on the one hand the production of courses and the correction of assignments and on the other hand the type of service to students that concerns information and advice before and during their studies, the handling and despatching of submitted lessons, the direction of studies that is done by means of distribution of circular letters and the provision of auxiliary means (records, tapes, laboratory kits, extra reading etc.). For no good reason the latter type of work enjoys less prestige than the former, which is considered being more "educational".

In fact the administrative procedures are so important that I feel

1 Cf. above pp. 10—11.

tempted to say that good courses and good corrections are of no avail if the office organization of a school does not work properly. If it does not, neither the suitable courses nor the constructive teacher comments will reach the students in time.

It is the task of the administrative organization to bring about

1 correct, competent and amiable treatment of all letters sent to the school, correct delivery of instructional material, informative circulars etc., and proper reception of students calling in person or on the telephone

2 short circuit time for lessons submitted and for letters applying for information and advice, containing questions, requests, complaints or suggestions etc.

3 accurate, immediately and easily available registration of data

4 checking-points and procedures for distributing reminders to students who fall behind or seem to be in danger of dropping out

5 facilities for supplementary teaching (oral refresher courses, laboratory instruction etc.)

6 general efficiency in all this at a reasonable cost

A school of any size will have to organize specialized departments for these activities. Computers are to some extent being used for the recording and providing of students' data (necessary for instructors, advisers and correspondents who cannot deal properly with their tasks without them).

Descriptive treatments of the administrative problems of correspondence schools are given in the CEC Yearbook 1965 by L. Öster and A. Saxe. Their contributions to the subject, the former of which reports on experiments made and reforms introduced in consequence of these, are most important, but, although they were entirely up to date in 1965, new developments have already changed the picture in the more advanced schools.

Each school has to build an organization of its own based on the requirements of the students and the society in which the school works. These organizations vary considerably between them. No doubt the gradual introduction of computers will cause great changes and enable schools to provide better and quicker service to their students than

they can today. The endeavours in this respect are of the greatest educational importance and should be treated as such. A follow-up paper based on Öster's very full account of 1965 is highly desirable.

What is still a novelty in education, computer-assisted instruction (CAI), can well be regarded as a modern administrative development of correspondence education. This is not a procedure for making the office administration of schools more efficient but for placing the techniques of electronic data processing at the disposal of students.

A computer is programmed in such a way that it contains a complete course. Via a teleprinter system or other similar devices students can use the computer and its programme from a number of centres at a distance from the computer. The teaching material is presented in the form of texts, TV-pictures or speech; and the student answers questions, for instance by typing his replies on a teleprinter-type machine. The computer provides practically immediate feed-back, correcting mistakes and enabling the student to advance.

This can undoubtedly be regarded as a combination of programmed instruction and correspondence teaching, as it includes a kind of two-way communication. It requires detailed, time-consuming programming, which must for evident reasons be very expensive. The same is true about the use of computers. Thus this type of teaching is at present practicable only when very large groups of students can be expected to make use of the same programmes, which normally means that the contents of the programme must be kept static for not too short a period.

Interesting experiments in the use of computer-assisted instruction have been made in the USA.[1] In Sweden the planning of small-scale experiments is at a preliminary stage.[2] The developments in this field may mean much for future correspondence instruction methods and must be closely followed by correspondence educators. Computer-assisted instruction includes only automatic, i.e. programmed, two-way communication but can, if applied by correspondence schools, easily be supplemented with actual correspondence by means of which students' spontaneous questions can be answered and individual teaching provided.

1 Lamber, Koenig and Vebber.

2 Datamaskinförmedlad utbildning.

Requirements of Today and Tomorrow

Correspondence education met with much prejudice in the past and in some countries it has still a long way to go to gain full recognition. However, at present when there is an unparalleled awareness of the need for education and training practically everywhere in the world, the ground is well prepared for the advance of unconventional methods provided they lead to reliable knowledge or skill and furnish a basis for further study.

Correspondence education seems to have a unique opportunity today in that it is becoming something of a commonplace that it is both effective in the sense described and is the method that most obviously encourages individual and independent study. If correspondence schools work in a responsible way and develop the intrinsic possibilities of their method to foster critical minds at the same time as they really define and thus promote their educational objectives better than most schools, they will then be able to make greater and greater contributions to education and training in the societies where they work and — as a consequence of this — gain the recognition and prestige that is their due.

The prejudice that used to impede some of the progress of correspondence education is to be found not only outside the pale of correspondence educators. It is true that some university professors, schoolmasters and others have been filled with superstitious belief in the value of lectures that students have to attend and — centuries after Gutenberg made his useful invention — have not even hesitated to give the same series of lectures again and again demanding compulsory attendance as though mere presence were of value. This is changing, however, and the need for using professors in a better way — as leaders of seminars etc. — is becoming increasingly recognized.

What to my mind threatens the progress of correspondence education much more seriously than that type of prejudice are the conservative attitudes found among some correspondence educators. We must all realize that what was good enough for our predecessors fifty years ago is not good enough for us; the mass of knowledge is growing at an exceedingly high speed and the contents of what members of today's societies must learn changes rapidly. There is in fact little static knowl-

edge, and so educators have to develop new and more efficient methods than we have had before. This is not less but probably more true about correspondence educators than others as correspondence schools can start teaching new subjects long before they are recognized as necessary items in school curricula.

To meet the demands of today and tomorrow, correspondence educators will have to follow the development of educational psychology and the science of learning more closely than before. Before planning new courses and new teaching engagements on the whole, correspondence schools will no doubt in the near future have to examine and define instructional goals and the so-called terminal behaviour that is nearer at hand in a much more scholarly way than ever before, they will have to consider educational measurement and instructional technology systematically and will find that the educator's need for knowledge and study of the science of education is growing as pedagogical intuition no longer leads sufficiently far sufficiently soon. This may seem to be an alarming note on which to end this paper. It is meant to be so. It is my firm belief that it is vitally important for correspondence educators to pay much attention to their own further training and give some thought to the training of the next generation in their field. It is not enough to know how to put correspondence education on the market. The time of educational amateurishness is over in correspondence schools anxious to keep abreast with today's developments.

Sources

The background of this paper is

the author's practical work as an instructor, an author of courses, educational director and head of a large correspondence school

consultations with specialists in various fields within correspondence education

study visits to a number of representative European and American correspondence schools

a scrutiny of the literature on the subject

a study of correspondence courses published by the following institutions:

Akademikergemeinschaft, Zürich, Switzerland
American School, Chicago, Illinois, USA
Brevskolan, Stockholm, Sweden
British Institute of Engineering Technology, Aldermaston, England
Die Briefschule, Frankfurt am Main, Germany
Capitol Radio Engineering Institute, Washington, D. C., USA
Cleveland Institute of Electronics, Cleveland, Ohio, USA
Correspondence School Blackfriars, Sydney, Australia
Correspondence School of the Victorian Department of Education, Fitzroy, Melbourne, Australia
Correspondence School, Wellington, New Zealand
Danmarks Brevskole, Copenhagen, Denmark
De Vry Technical Institute, Chicago, Illinois, USA
L'École des Sciences et Arts, Paris, France
L'École Universelle, Paris, France
Elingaard Brevskole, Oslo, Norway
Établissements Pigier, Paris, France
Famous Artists School, Westport, Connecticut, USA
Försvarets Brevskola, Stockholm, Sweden
Hadley School for the Blind, Winnetka, Illinois, USA
Hamburger Fern-Lehrinstitut, Hamburg, Germany
HERMODS-NKI, Malmö, Sweden
Institut für Fachschulwesen der deutschen demokratischen Republik, Karl-Marx-Stadt, Eastern Germany

Institut Onken, Kreuzlingen, Switzerland
Institute of University Studies, Bergensfield, New Jersey, USA
International Correspondence Schools, London, England, and Scranton, Pennsylvania, USA
Key Training Service, Miami Beach, Florida, USA
Korrespondanse Akademiet, Oslo, Norway
Lantbruksförbundets Tidskrifts Korrespondensskola (LTK), Stockholm, Sweden
Lasalle Extension University, Chicago, Illinois, USA
Leidsche [illegible]nderwijsinstellingen, Leiden, The Netherlands
Loyola [illegible]niversity, Chicago, Illinois, USA
Metropolitan College, St. Albans, England
National Extension College, Cambridge, England
National Radio Institute, Washington, D. C., USA
Norsk Korrespondanseskole, Oslo, Norway
Sir Isaac Pitman Correspondence College, Godalming, Surrey, England
Royal Melbourne Technical College, Melbourne, Australia
Rustin-Lehrinstitut für Fernunterricht, Düsseldorf, Germany
Stamford College, Singapore, Malaysia
Studiengemeinschaft Werner Kamprath, Darmstadt, Germany
Sydney Technical College, Broadway, Australia
Technisches Lehrinstitut Onken, Kreuzlingen, Switzerland
United States Armed Forces Institute, Madison, Wisconsin, USA
University of Nebraska, Lincoln, Nebraska, USA
University of Wisconsin, Madison, Wisconsin, USA
Wolsey Hall, Oxford, England

A Short Bibliography

Works written in other languages than English, German or French have been included in the list below only in the cases when — to the author's knowledge — no approximate equivalent exists in any of the languages mentioned.

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